

Edition 10 A

Radio / Tech Modifications

& Alignment Controls

1998N
6MQS

10A

Modifications for:

Icom
Kenwood
Scanners

See back cover for specific radios

Este manual foi doado por Yvo Muniz da Alpha Telecom para ser scaneado e disponibilizado GRATUITAMENTE a toda a comunidade

Scaneado em cores, 300 DPI (é o maximo que minha maquina faz, nao me batam) em uma copiadora Lexmark X864de, imagens tratadas com o programa IRFANVIEW e pdf gerado com o Adobe Acrobat XI Pro, usando Clearscan

Eu scaneio, trato e disponibilizo manuais gratuitamente meramente pelo prazer de faze-lo. Caso voce queira ajudar com manuais, insumos e ate mesmo uma merrequinha pra ajudar na conta de luz e na manutenção da maquina, entre em contato pelo email alexandre.tabajara@gmail.com (tambem é pix)

Obrigado a todos que ajudaram ate aqui

Os sites onde esses scans podem ser encontrados:

- www.bama.org
- <http://tabajara-labs.blogspot.com>
- <http://tabalabs.com.br/esquemateca>
- <https://datassette.org/>

ATENÇÃO: AS PAGINAS EM BRANCO ESTAO EXATAMENTE COMO NO MANUAL. O OBJETIVO DE MANTE-LAS É VOCE PODER IMPRIMIR UM MANUAL IDENTICO AO ORIGINAL. NAO ESTÁ FALTANDO PAGINA NENHUMA NO MANUAL

Distribuição **GRATUITA**. Respeite o meu trabalho.
São Paulo, Agosto de 2021



Radio / Tech Modifications

& Alignment Controls

1998N
6MQS

10A

artsci

P.O. Box 1428
Burbank, CA 91507
(818) 843-4080
(818) 846-2298 FAX
books@artscipub.com
<http://www.artscipub.com>

Radio / Tech Modifications

Copyright © 1990, 91, 92, 93, 94, 95, 96, 97, 98 artsci, inc.

All rights reserved. No part of this book may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, recording or by any information storage and retrieval system, without permission in writing from the Publisher:

artsci inc.,
P.O. Box 1428
Burbank, CA 91507.

EDITION 10A

98 99 10 9 8 7 6 5 4 3 2 1

ISBN 0-917963- \$19.95

Notice of Liability

The information in this book is distributed on an "AS IS" basis, without warranty. Neither the author nor artsci inc shall have any liability to the customer or any other person or entity with respect to any liability, loss, or damage caused or alleged to be caused directly or indirectly by the information contained herein. This includes, but is not limited to, interruption of service, loss of use, loss of business or anticipatory profits, or consequential damages from the information in this book.

artsci inc, books are available for bulk sales at quantity discounts. For information, please contact Marketing Manager, artsci inc, P.O. Box 1428, Burbank, CA 91507
FAX: (818) 846-2298

Artsci may be contacted in the INTERNET

email - books@artscipub.com
URL - <http://www.artscipub.com>

artsci
artsci
artsci
artsci
artsci
artsci
artsci
artsci
artsci

Grab Hold of ICOM!

PC Software Available!

for DOS or Windows™

for IC-W32A • IC-T7AHP

IC-T22A

SHIRT POCKET SMALL, FUN, EASY-TO-USE!

The IC-T22A (VHF)/IC-T42A (UHF) is packed with features, power and performance. The slim, compact design fits almost anywhere. Transmit with up to 5 watts (@9.6 V) of output power. The tall antenna, large speaker and precise surface mount circuitry provide

CRYSTAL CLEAR AUDIO

Expand receive capability to include AM aircraft with a simple keypad adjustment. An **ALPHANUMERIC DISPLAY** makes it easy to ID what's stored in each memory channel, and makes a great alpha message pager. A built-in EEPROM protects memory settings if battery power runs too low. MARS and CAP capable. Size it up today!

IC-W32A

ADVANCED FEATURES, EASY TO USE!

Slim and compact, the IC-W32A is ICOM's top-of-the line 2M/440MHz dual bander. Up to 5 watts of power, **NO FUNCTION BUTTON**

(simple to operate!) and plenty of whistles and bells. For example, a VHF/UHF exchange function allows you to assign VHF/UHF tuning and volume to either knob. A "guide" function provides quick identification for button assignments. Receive two frequencies on one band or search for signals on one band while waiting for a transmission on the other (V/V and U/U). With **200 MEMORY CHANNELS**

(100 per band) and 8-character alphanumeric tags, your favorite frequencies are always at hand. Use **PC PROGRAMMING**

or the keypad to set features and memories. Get CTCSS encode/decode, CTCSS tone scan, DTMF encode/decode, battery voltage meter, auto power off, battery save and much more. Best of all, it's an ICOM!

IC-T7AHP

MORE POWER!

NOW WITH 4 WATTS OF POWER OUT OF THE BOX!

Dual bands (2M/440MHz) at a single bander size and price! Even with lots of features, learning the IC-T7AHP is a snap.

NO FUNCTION BUTTON

"My favorite test is to grab a radio fresh out of the box and measure how long it takes to access my local repeater — without consulting the manual. For the ICOM IC-T7A my watch stopped at 60 seconds!"

— QST, July 1997

Toggle between bands with one touch of the BAND key. Use the thumb "slide-lock" to secure the keypad. Up to 70 memory channels **PC PROGRAMMABLE**

allow quick access to favorite frequencies and settings. If you get stuck, an "Intuitive" Help Function pops up. Try one today!



IC-W32A and IC-T7AHP:
For CS cloning software,
an optional OPC-474 cloning
cable is required.
For CSWHH software, the
needed cable is
included

PC Ready!

ICOM'S ON THE WEB!
<http://www.icomamerica.com>

Visit your authorized ICOM dealer, or call for a FREE Brochure: (425) 450-6088

Questions? Contact your ICOM dealer, or contact ICOM Technical Support in the HamNet forum on CompuServe® @75540,525 (Internet: 75540.525 @compuserve.com).

© 1997 ICOM America, Inc., 2380-116th Ave. N.E., Bellevue, WA 98004. The ICOM logo is a registered trademark of ICOM, Inc. All stated specifications are subject to change without notice or obligation. All ICOM radios significantly exceed FCC regulations limiting spurious emissions. CompuServe is a registered trademark of CompuServe, Incorporated, an H&R Block Company. 3HH1097Y

ICOM®

Dual Bands Now Go More Places

With one touch,
switch between
2 meters &
440MHz



Comes with the HM-98
full function, full control mic.

Car dashboards seem to keep getting smaller. Where are you going to fit that big ol' mobile rig? Get a new ICOM IC-207H dual bander (2 meter / 440 MHz). Its ultra small, detachable control panel will fit just about anywhere, including your budget!

ONE-TOUCH BAND SELECTION

- Tx: 144-148 MHz, 440-450 MHz
- Wide Band Rx: (includes Airband): 118-174 MHz, 440-450 MHz
- 45 W VHF (2M), 35 W UHF (440 MHz)
- 4 Power Settings per Band
- CTCSS Encode/Decode-Standard
- Built-In Duplexer

9600 BPS PACKET READY

A 6-pin connection point on the back panel is provided for packet operation

- 162 Memory Channels
- Auto Repeater Function
- Full Function HM-98 Microphone-

Control all radio functions, right in your hand. You can even use this mic to program the radio!

- Optional HM-90 Infrared Wireless Microphone for cable-free operation

Big dials, big keys and a big, bright display make for easy operations, day or night!

IC-207H

2M/440MHZ

ULTRA SMALL

DETACHABLE FRONT PANEL

Dual Bander at a single bander price!

SMALL SIZE, BIG VALUE

Front Panel Dimensions: 4 11/32(w) x 1 17/32 (h) x 1 1/16 (d). Mount it anywhere! ICOM's Next Generation technology keeps the IC-207H's performance and reliability running high while keeping the price affordable for today's ham.

Visit your authorized ICOM dealer today, or call for a free brochure: 425-450-6088



Use a PC to download up to 160 frequencies into the IC-207H. It's a fun, useful tool for trip planning!

ICOM options required for PC cloning:
CS-207 Cloning Software
OPC-646 Cloning Cable

A third party 6-pin serial cable is required for PC packet connection

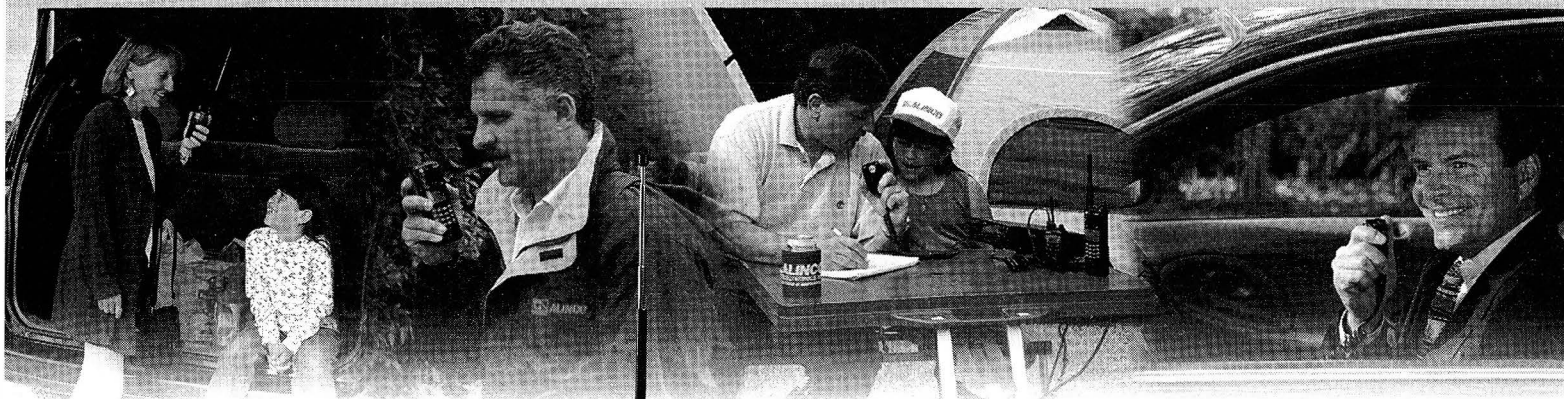
ICOM®

QUESTIONS? Contact your authorized ICOM dealer or contact ICOM Technical Support on CompuServe's HamNet forum at 75540,525 (internet: 75540.525@compuserve.com). *Optional OPC-600 or OPC-601 separation cable required for remote head operation. ©1997 ICOM America, Inc. 2380-116th Ave NE, Bellevue, WA 98004 • 425-454-8155. The ICOM logo is a registered trademark of ICOM, Inc. All specifications are subject to change without notice or obligation. CompuServe is a registered trademark of CompuServe, Inc. an H&R Block Company. 207ART897Y

CHECK IT OUT ON ICOM'S WEB SITE: <http://www.icomamerica.com>

WHAT'S NEW AND EXCITING FROM AMATEUR RADIO'S VALUE LEADER?

Great new radios that are fun, easy to operate and very affordable!



NEW DJ-S11T 2 Meter Pocket Radio

It's the one you asked for! Full 2 Meter coverage (144 ~ 148 MHz), 21 memories, CTCSS encode, self-storing telescoping antenna, accepts speaker mic and outside power, runs on 3 AA batteries, even has MARS/CAP capability. Get all this and more at a price under \$150!!



DJ-S41T 70 cm Pocket Radio

Already a "best seller," the DJ-S41T covers 425 ~ 450 MHz, has 21 memories, CTCSS encode, self-storing pivot antenna, accepts a wide range of accessories. Perfect for use with repeaters, simplex or cross band links. At under \$150, every ham in the family can own one!

DR-605T(Q) 2 Meter + 70 cm Mobile/Base

The reviews are in and the DR-605T is a winner! Work repeaters, simplex, cross-band, even satellites. 102 memories, CTCSS, built-in antenna duplexer, MARS/CAP capability, clone function, 9600 packet port and more at a price so low, it's hard to believe.



DR-140T(Q) 2 Meter Mobile/Base

A new full-featured radio with Alphanumeric display (up to 7 characters), 51 memory channels, aircraft (AM) plus extended VHF receive, CTCSS + European Tone Bursts, MARS/CAP capability, clean design, scanning and cloning functions, all at a very low Alinco price.



HF + 6 Meter DX-70 TH and DX-70T

Choose your preference in output power on 6 meters. The DX-70TH



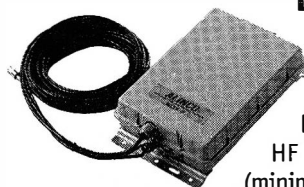
transmits up to 100 watts on all Amateur Bands, 160 ~ 6 Meters; the economical DX-70T is 100 watts on HF, 10 watts out on 6. With either radio you get General Coverage Receiver (150 KHz ~ 30 MHz and 50 ~ 54 MHz), face plate that can be remote mounted, built in narrow filter and speech processor, full QSK, semi or automatic break-in, multi-function control and more.

EDX-2 Automatic Antenna Tuner

Connects directly to any Alinco DX-70 model, quickly tunes a wire or mobile whip antenna at the touch of a button.

Perfect for mobile, portable, base or marine HF operations. Matches 160 ~ 10 meters

(minimum 40 foot wire antenna required for 160 meters, 9.8 foot minimum for others.) Can be mounted outdoors.



Alinco World Time Alarm Clock

By popular demand, now available at your dealer for only \$39.95. It's great for the shack, camping, travel, Field Day or DX-peditions!

Prices mentioned are MSRP, dealer prices may vary. Permits required for MARS/CAP use. Performance specifications only apply to amateur bands. Specifications subject to change without notice or obligation.

Simple ■ Clean ■ Dependable



ALINCO

AMATEUR RADIO'S VALUE LEADERSM

U.S.A. Alinco Branch: 438 Amapola Ave. • Suite 130 • Torrance, CA 90501
Phone: (310) 618-8616 • Fax: (310) 618-8758 • Internet: <http://www.alinco.com>

Ask your dealer about Alinco's 2-year extended warranty program

TS-32P DIP Switch Programmable Encoder-Decoder**\$57.95**

Universal design provides CTCSS capability to all FM transceivers. On-board DIP switch allows instant programming without tone elements, counters, or other test equipment. Crystal controlled for high accuracy and stability. The 32 location tone memory is complete with standard EIA tones from 67.0 to 203.5 Hz, or may be ordered with ANY 32 custom tone frequencies between 0 - 250.0 Hz (± 0.1 Hz) at no extra charge. Multiple tone switching is easily done with your radio's channel select switch or separate single pole switch. A high pass tone rejection filter is included on board to remove tone from received audio. Reverse polarity protection and RF immunity are built in. Powered by 6 - 24 vdc, unregulated at 8ma. Supplied with color-coded wires terminated to plug directly onto the TS-32P. Mounting materials include hardware and double sided, insulated tape.

TS-64 Microminiature CTCSS Encoder-Decoder**\$64.95**

The latest - and smallest - programmable CTCSS encoder-decoder for use in FM transceivers. Ideal for many handheld radios and others with limited space. Select from 64 preset CTCSS tones between 33.0 Hz and 254.1 Hz using six PCB jumpers. Tone stability is crystal controlled with accuracy better than 0.05 Hz. Output level can be adjusted from 0V to 3.0V. A time-out-timer feature permits programming transmit duration to eight different intervals decreasing "stuck mic" problems. Receiver Hi-pass filter and busy channel lockout are included. Decode sensitivity is 15mv. Power can be from 6.0vdc to 20.0vdc @ 9ma. Operating temperature range is from -30°C to $+65^{\circ}\text{C}$. When P.T.T. switch is released, the TS-64 continues to key transmitter for 160ms. During this time, the TS-64 generates a reverse phase burst which will mute the decoding unit at the other end. A microminiature plug and socket with color coded wires attached is provided for hookup. Comes with double sided tape for quick mounting.

SS-32PA DIP Switch Programmable CTCSS Encoder**\$28.95**

Universal design provides CTCSS encode capability to all FM transceivers. On-board DIP switch allows instant programming without tone elements, counters, or other test equipment. Crystal controlled for high accuracy and stability. The standard 32 tone memory contains the EIA tones from 67.0 to 203.5 Hz (or may be ordered with ANY 32 custom tone frequencies between 0 - 250.0 Hz at no extra charge). Multiple tone switching is easily achieved with your radio's channel select switch or a separate single pole switch.

SS-32SMP Micro-Miniature CTCSS Encoder**\$27.95**

Super small programmable CTCSS encoder for use in handheld radios and other size restricted applications. Has the same basic features as the SS-32PA (see above), but does not include the on-board DIP switch due to size limitations. Programming is done by soldering binary coded jumpers on the tone board.

TE-64 Multi-purpose CTCSS/Burst Tone Encoder**\$79.95**

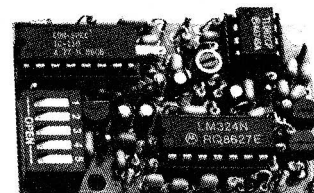
Fully enclosed encoder provides, from a front dial rotary switch, all EIA CTCSS tones from 67.0 to 203.5 Hz PLUS all the common burst tones from 1600 to 2550 in 50 Hz increments. All available tone frequencies are permanently screened onto the faceplate, and selected with a calibrated dial. Great for test bench or service vehicle applications. Operates on 6-30 vdc, and all connections are made to a terminal strip at the rear of the unit. A 9 volt battery plug and cable is included, and may be attached at the terminal strip or soldered directly to the circuit board for field operation. Packaged in a high impact plastic case, with mounting bracket and hardware supplied.

TE-64D Multi-purpose CTCSS/Burst Tone Encoder w/Display**\$129.90**

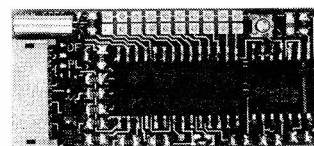
An enhanced version of the TE-64 encoder (see above). Features a two-digit LED which displays a number from 01 to 32 that in turn corresponds with the CTCSS or burst frequency selected by the front panel rotary switch. The two-digit number displayed is cross-referenced to the tone frequency on a chart located on the faceplate. Perfect for mobile applications, night-time operations, or whenever high visibility read-out is desired. Operates on 6-16 vdc (current draw does not allow operation from 9 volt battery).

NEW!**ID-8 Automatic Morse Station Identifier****\$89.95**

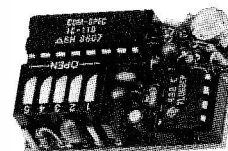
Provides automatic Morse station identification for commercial, public safety, and amateur radio applications, including repeaters, base stations, mobiles, beacons, CW memory keyers, etc. Meets all FCC identification requirements. Low voltage/current operation and small size make it universally applicable. Low distortion, low impedance, adjustable sinewave output. High accuracy crystal control. All functions are programmable with plug-on keypad, included with each unit. Programmable options include: Eight selectable messages; CW speed 1-99 seconds; interval timer 1-99 minutes; hold off timer 0-99 seconds; CW tone frequency 100-3000 Hz; front porch delay interval 0-9.9 seconds; CW or MCW; etc. All programming is stored in a non-volatile EEPROM, which may be altered at any time via the included keypad. Supplied with programming keypad, wire set with microminiature plug for easy installation or removal, both hardware and tape mounting materials, and easy to follow instructions.



Programmable Encoder-Decoder
1.25"x 2.0"x 0.40"



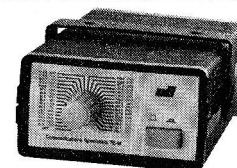
Microminiature CTCSS Encoder-Decoder
.78"x 1.70"x .25"



SS-32PA / SS-32PB Encoder
0.9"x 1.3"x 0.4"



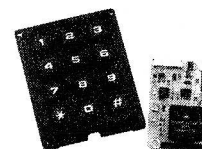
SS-32SMP / SS-32SMP-B Encoder
0.53"x 1.00"x 0.16"



TE-64 Tone Encoder
5.25"x 3.3"x 1.7"



TE-64D Tone Encoder w/Display
5.25"x 3.3"x 1.7"

NEW!

ID-8 Automatic Morse Code Identifier
1.85"x 1.12"x 0.35"

Contents

INTRODUCTION..... 1

Phone support and new modifications
Scanner modification problems
Modifications and the law

SURFACE MOUNT COMPONENTS..... 6

How to remove them
How to install them
Common chip diode layouts

Amateur Radios (by manufactures)

ICOM.....Icom - 1

KENWOOD..... Kenwood - 1

Scanners (by manufactures)

AOR.....Scanners - 2

RADIO SHACK..... Radio Shack - 3

REGENCY.....Regency - 23

UNIDEN.....Uniden - 26

PROOF OF PURCHASE..... Last Page

PHILIPS - EIMAC - AMPEREX - GE

PENTA LABS - RCA - BURLE - RFP

MOTOROLA - MITSUBISHI - TOSHIBA - PRIDE

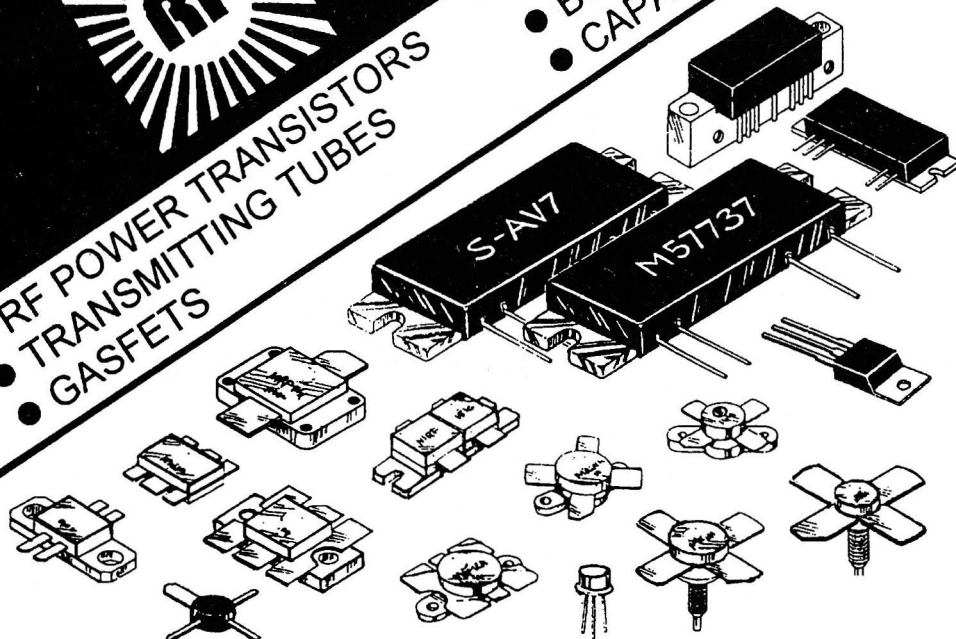


RF PARTS COMPANY

SAN MARCOS, CA 92069

- RF POWER TRANSISTORS
- TRANSMITTING TUBES
- GASFETS

- RF POWER MODULES
- BOOKS & MANUALS
- CAPACITORS



SVETLANA - JOHNSON - NEC

Hi-Gain, Matched, & Selected Transistors available for Solid State Transmitters and Linear Amplifiers. RF Power Modules in stock for Amateur, Marine, and 2-Way Radio.



Same Day Shipping on most orders. • Catalog Available.
Tel: (619) 744-0700 Fax: (619) 744-1943

Se Habla Español



Order Line

1-800-RF-PARTS

Order Line

Introduction

THERE ARE 2 BOOKS IN THIS EDITION SET. AN ORDER FORM FOR THE OTHER BOOK IS AVAILABLE IN THE BACK OF THIS BOOK.

The newest versions of RADIO/TECH MODIFICATIONS are Edition 10, part A (10A) Edition 10, part B (10B). Edition 10A contains all known modifications for ICOM and Kenwood Radios and mods for the popular scanners. Edition 10B has all the modifications for Yeasu, Alinco, Standard, Azden, KDK, Ten Tec, Ranger, Uniden, Radio Shack and popular CB radios.

During the past 8 years we have created 10 Editions of Radio/Tech modifications. Each new edition included the information contained in the previous editions. So if you have the current edition, you do not need to purchase the previous ones.

We make every effort to improve the illustrations with each new edition. The modifications presented here have been performed by many people throughout the world. Unless the manufacturer changes the radio in some significant way, the modifications contained in this book are accurate and current.

We make every effort to provide all available modifications for every radio we can find. In some cases, additional information is available for a radio that can not be presented in the book. We try and keep this information on file and will provide it to verified owners of the current edition for a small fee. We also try to keep the cost of the modification books as low as possible. We ask that you do not photocopy pages from these books. We will support you however we can, however, if you call us we will ask that you have the book in your hands at the time of the call.

It was only logical that we start to include the alignment points for each of the radios. Since you are inside them performing the modification, it is a good time to adjust the Modulation and Power levels.

Phone Support and New Modifications

If you find a new radio is not listed in these pages, contact us and ask about it. We may have a copy that did not make the printing deadline. If you purchased the current book and have sent in the proof of purchase/update request form, we can send the new modification to you.

We produce new editions of this book every year. If you have the most current edition, we will mail or FAX you any requested modification we may have available when you send in the form in the back of the book. You **MUST** send in the proof of purchase/update form in the back of this book to receive phone or mail support.

Once we have a new edition available, you must purchase it before we can continue support on any new or revised modifications.

Your comments and suggestions are always welcome. If the modification works great, let us know. If you can't make the modification work, let us know. We can't test every modification, we don't have all the radios. Your help will make the next volumes better for everyone.

A good percentage of our modifications come from people just like you. They may discover the modification themselves or talked someone into sending a copy of the manufacturers modification sheet.

When you help us find or improve a modification, we often say thank you with no charge copies of our books. Let's work together to create a high quality book that everyone can use.

Scanner Modification Problems

In 1993 the FCC created some new rules about scanners and the frequencies they may receive. (SEE the section Modifications and the law, below)

The Manufactures were forced to modify all versions of their scanners to comply with the new law. The modifications that worked on the old versions no longer work on the new versions.

Most of the modification presented here work on the older versions but not on the new ones. We have found some of the new modifications and have presented them in this book. As more become available, we will include them in future editions.

We expect that the manufactures have a modification available for the new versions, but are not releasing it to anyone. If they locked out any modification, they will only be hurting their own future sales.

If you have a problem with a modification, let us know and we will make any new information available to you.

If you purchased one of these scanners, write a letter to the manufacturer and express your personal dissatisfaction. If they get enough letters and complaints they may think twice before limiting their products in the future.

If you need a scanner that can be modified, contact a dealer in another country like Canada and purchase one there. It may cost you a bit more.

Your other option is to purchase an amateur radio receiver. These receivers will be more expensive, but will outperform any other retail scanners.

Modifications and the law

Cellular Phone Bands

The Federal Communications Commission (FCC) is the agency in charge of controlling the airwaves in the United States. It has been their responsibility to oversee the content of the transmissions from broadcasters in the United States.

On April 26, 1993, the FCC decided that they should not only control what information is broadcast on the airwaves, they should also control the sale of radios capable of receiving certain frequencies.

The issue in this decision is protecting the privacy of cellular phone users. The Cellular phone frequency band in the upper 800 MHz range has become a favorite scanner listening band. The cellular users deserve their privacy. Hence, the FCC has declared a ban on all scanner style radios or converters capable of receiving the cellular band.

The wording of the new law is intended to regulate what type of receivers may be sold in the United States.

Section 15.121 Scanning receivers and frequency converters designed or marketed for use with scanning receivers.

(a) Except as provided in paragraph (b), scanning receivers, and frequencies converters designed or marketed for use with scanning receivers, must be incapable of operating (tuning), or readily being altered by the user to operate, within the frequency bands allocated to the domestic Public Cellular Radio Telecommunications Service in part 22 of this chapter (cellular telephone bands). Receivers capable of "readily being altered by the user: include, but are not limited to, those for which the ability to receive transmissions in the cellular telephone bands can be added by clipping the leads of, or installing, a simple component such as a diode, resistor and/or jumper wire; replacing a plug-in semiconductor chip; or programming a semiconductor chip using special access codes or an external device, such as a personal computer. Scanning

receivers, and frequencies converters designed or marketed for use with scanning receivers, must also be incapable of converting digital cellular transmissions to analog voice audio.

(b) Scanning receivers, and frequency converters designed or marketed for use with scanning receivers, that are manufactured exclusively for, and marketed exclusively to, entities described in 18 U.S.C. Section 2512 (2) are not subject to the requirements of paragraph (a).

It seems apparent that the FCC is attempting to protect the cellular phone users' privacy. The Cellular industry is also taking reasonable precautions to protect their users with their new digital technology. Perhaps after digital takes over, the FCC will relax or repeal the rule.

Transmitting out of band

The Federal Communications Commission (FCC) has another set of rules that controls the type of transceivers approved for use in the United States. The purpose is to make sure that transmissions are clean and do not cause interference or emissions on other frequencies.

The FCC has special relaxed rules for Amateur equipment that help to encourage lower pricing for transceivers. The FCC will approve a radio for use only in the Amateur frequency range, but the same radio may be refused for use in the Business band.

Use of a Amateur approved radio to transmit outside the amateur band is illegal no matter what type of license you have, (MARS & CAP do have a permission to exceed the limits by 3-4 MHz).

No discussion about transmission on the Police bands is needed here. It is illegal and wrong and can cause loss of Human life. If you know of anyone doing it, turn them in.

Excess heat can lift the circuit board traces right off the board. A small section might stick to the soldering iron and you might not notice until you discover the radio won't work.

Caution must be taken to protect the component also (if you will need it again). Remove a little solder and move to the other side of the component. After 2-5 times the part will pop off!!

Installing components is easier than removing them. Excess heat during installation should also be avoided.

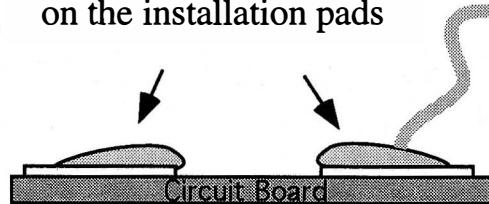
Place a small amount of solder on the circuit board pads before you attempt to install the component. This will allow you to place the part in position and use the iron to melt the solder and it will attach the component in place.

Remember to hold the component in place using a blunt tool or screwdriver. Small surface mount components seem to jump right off the board and glue themselves to a soldering iron.

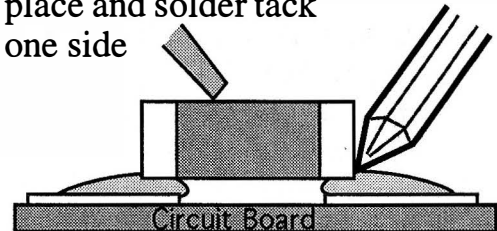
To test if a component is properly attached, use a volt/ohmmeter. Attach a lead to the trace on the circuit board and make sure that continuity is present.

Installing

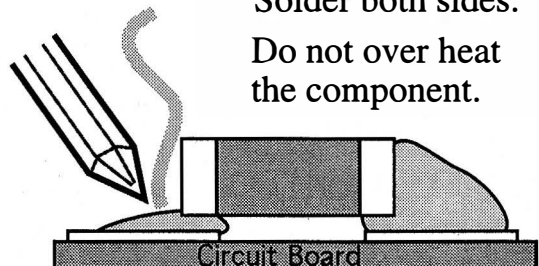
Place a small amount of solder on the installation pads



Place the component on the board
Hold the component in place and solder tack one side



Solder both sides.
Do not over heat the component.



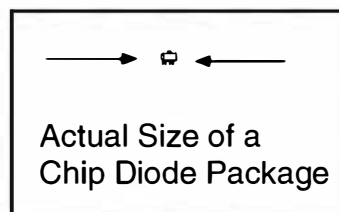
Solder should be smooth and fully bonded to the component

- Some technicians prefer to use a solder sucker to remove solder.
- Components can be damaged by excess heat.
- Components may adhere themselves to the tip of the soldering iron if not held in place.

Chip Diode Package Layouts

Many of the modifications presented in this text require you to remove or install surface mount components.

Some of these modifications use very small packages with three leads. About a year ago I ordered 50 of a popular package and accidentally dropped them on the carpet, I lost 20 of them because I couldn't find them!!

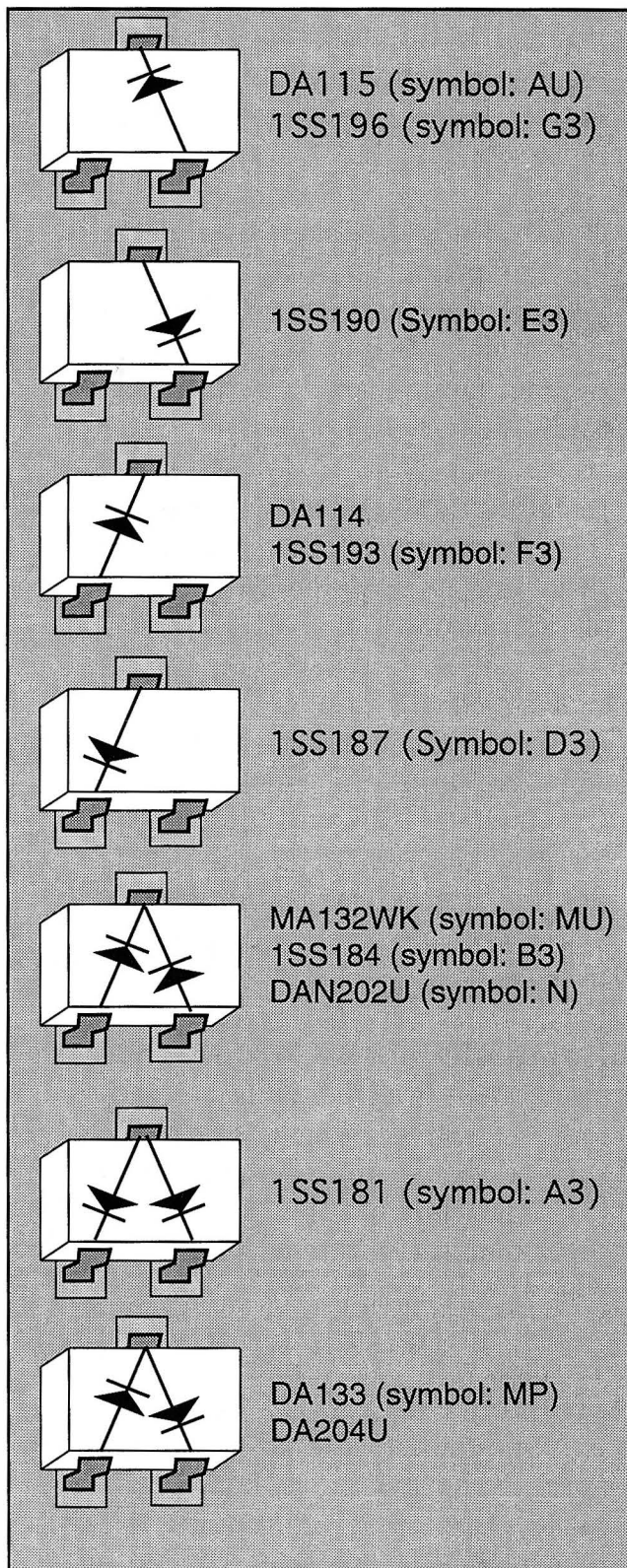


These components are available directly from the radio manufacturers' parts department.

Some experienced technicians may elect to use separate 1N914 diodes in place of these diode packages.

The only problem with using 1N914 diodes is that they are 3-4 times larger than the diode package and may not fit properly.

However, here are the diode package layouts for the popular packages.



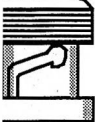
ICOM RADIO MODIFICATIONS

Radio	Modification	Page #
IC-02AT	Expanded RF / Scan rate Increase.....	3
IC-2A/AT	Alignment controls.....	4
IC-2iA	Expanded RF.....	5
IC-2GAT	Expanded RF / Alignment controls.....	8
IC-2GXAT	Expanded RF.....	9
IC-2SA	Expanded RF / Alignment controls.....	6
IC-2SAT	Expanded RF / Alignment controls.....	6
IC-2SRA	Expanded RF / Alignment controls.....	7
IC-3SAT	Expanded RF / Alignment controls.....	6
IC-04AT	Expanded RF	3
IC-4GAT	Expanded RF/ Alignment controls.....	8
IC-4iA	Expanded RF.....	5
IC-4SAT	Expanded RF/ Alignment controls.....	6
IC-4SRA	Expanded RF/ Alignment controls.....	7
IC-12AT	Expanded RF	10
IC-12GAT	Alignment controls.....	10
IC-24	Expanded RF/ Alignment controls.....	12
IC-25	Expanded RF/ Alignment controls.....	13
IC-27A/H	Adjustment controls.....	14
IC-28A/H	Expanded RF/ Alignment controls.....	15
IC-32AT	Expanded RF / 10MHz entry / X Band Repeater.....	16
IC-38	Adjustment controls.....	17
IC-48	Expanded RF	18
IC-207	Expanded RF	19
IC-228	Expanded RF/ Alignment controls.....	20
IC-229	Expanded RF/ Alignment controls.....	21
IC-281	Expanded RF	22
IC-290	Expanded RF	23
IC-448	Expanded RF/ Alignment controls.....	24
IC-449	Expanded RF/ Alignment controls.....	25
IC-481	Expanded RF	22
IC-575	Expanded RF	27
IC-706	Expanded RF	28
IC-707	Expanded RF	31
IC-720	Expanded RF	32
IC-725	Expanded RF	33
IC-726	Expanded RF	33
IC-728	Expanded RF	34
IC-729	Expanded RF	34
IC-730	Expanded RF	35
IC-735	Expanded RF	36
IC-736	Expanded RF	37
IC-737	Expanded RF	38
IC-738	Expanded RF	39
IC-740	Expanded RF	40
IC-745	Expanded RF	40
IC-751	Expanded RF	40
IC-761	Expanded RF	43
IC-765	Expanded RF	44
IC-775	Expanded RF	45
IC-781	Expanded RF	46
IC-820	Expanded RF	47

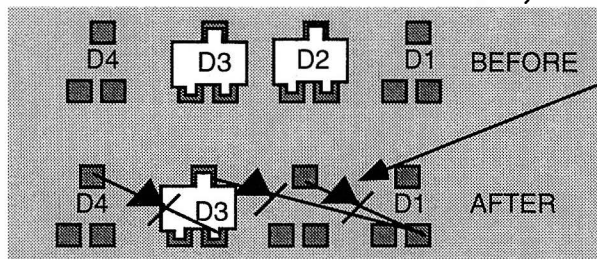
ICOM

ICOM RADIO MODIFICATIONS

Radio	Modification	Page #
IC-821	Expanded RF	48
IC-900	Expanded RF / Alignment controls / X Band Repeater.....	49
IC-901A	Expanded RF / X Band Repeater.....	50
IC-970	Expanded RF/ X Band Repeater.....	51
IC-1200	Expanded RF - 870-960 MHz.....	52
IC-2000	Expanded RF	53
IC-2330	Expanded RF.....	54
IC-2340	Expanded RF / X Band Repeater.....	55
IC-2350	Expanded RF	56
IC-2400	Expanded RF - Mars/Cap+ / X Band Repeater / Alignment Cont....	57
IC-2410	Expanded RF.....	58
IC-2500	Expanded RF - Mars/Cap+ / X Band Repeater / Alignment Cont....	60
IC-2700	Expanded RF.....	61
IC-2710	Expanded RF.....	62
IC-3200	Expanded RF/ Alignment controls.....	64
IC-3210	Expanded RF - Mars/Cap+ / X Band Repeater / Alignment Cont....	65
IC-3220	Expanded RF - Mars/Cap+ / X Band Repeater / Alignment Cont....	66
IC-3230	Expanded RF.....	67
IC-DELTA1	Expanded RF.....	69
IC-DELTA 100 E	Expanded RF.....	70
IC-H16	User Programmable mod.....	71
IC-M600	Expanded RF	72
IC-M800	Expanded RF	73
IC-P2AT	Expanded RF/ Alignment controls.....	75
IC-P4AT	Expanded RF/ Alignment controls.....	75
IC-R1	Expanded RF	76
IC-R10	Expanded RF	77
IC-R100	Expanded RF	79
IC-R7000	100 Memory channels.....	80
IC-R71	Expanded RF	81
IC-R7100	Expanded RF.....	82
IC-R8500	Expanded RF.....	83
IC-RP1220	CTCSS Default.....	84
IC-RP1520	CTCSS Default.....	84
IC-RP4020	CTCSS Default.....	84
IC-RP4520	CTCSS Default.....	84
IC-S21	Expanded RF.....	85
IC-S41	Expanded RF.....	86
IC-T7	Expanded RF.....	87
IC-T21	Expanded RF.....	85
IC-T22	Expanded RF.....	85
IC-T41	Expanded RF.....	85
IC-U2AT	Expanded RF / Alignment controls.....	89
IC-U4AT	Expanded RF / Alignment controls.....	90
IC-U16	User Programmable mod.....	71
IC-V21 AT	Expanded RF/ Alignment controls.....	88
IC-W2A	Expanded RF / Alignment controls.....	91
IC-W21A	Expanded RF / X Band Repeater.....	93
IC-W21AT	Expanded RF / X Band Repeater / Alignment controls.....	94
IC-W31	Expanded RF.....	95
IC-W32	Expanded RF.....	96
IC-X2A	Expanded RF/ Alignment controls.....	91
IC-X21AT	Expanded RF.....	98
IC-Z1A	Expanded RF	99

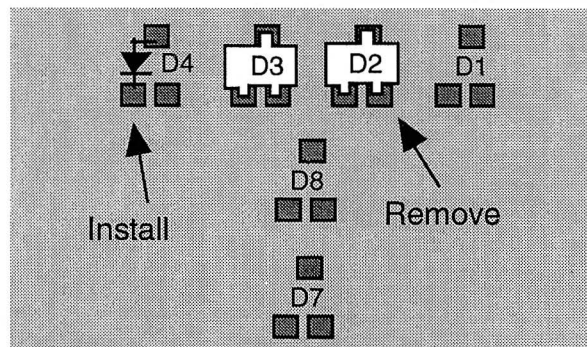


IC-02 Ser # below # 34,000



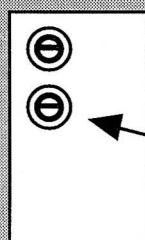
One report shows this diode is not needed.

IC-02 Ser # over # 34,000 IC-04 all serial numbers



Note Adjust VCO for .8 v. DC at lowest desired Freq. Measure at VCO test point, tip of resistor R253.

PLL UNIT under back cover



Adjust
.8 VDC @ Lowest
Freq

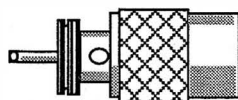
Test Point

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz. Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

Expanded RF Modification

1. Remove battery and antenna.
2. Remove screws open case.
3. Locate and remove chip diode D2 on Logic unit.
4. On 02's with ser # over 34,000 - Install a diode across pads of diode D4 (see drawing) 1N4148 or 1SS211
5. On serial #'s below 34,000 install three diodes. (see drawing)
6. Locate R413 on logic board, it is located below the right hand corner of the microprocessor. The letters C6 are printer above it and 13 is below it.
7. Attach (piggy-back) another 270,000 resistor on to R413. (Scan Mod)
A very small resistor is required. If you use a 1/8 watt or larger use wire rap wire to mount it our of the way.
8. Reassemble the radio.
9. Reset the microprocessor. (ser#<34000 Push button next to lithium battery, on >34000 Hold [FUNCTION] and turn power on

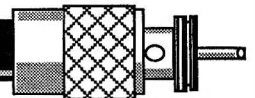
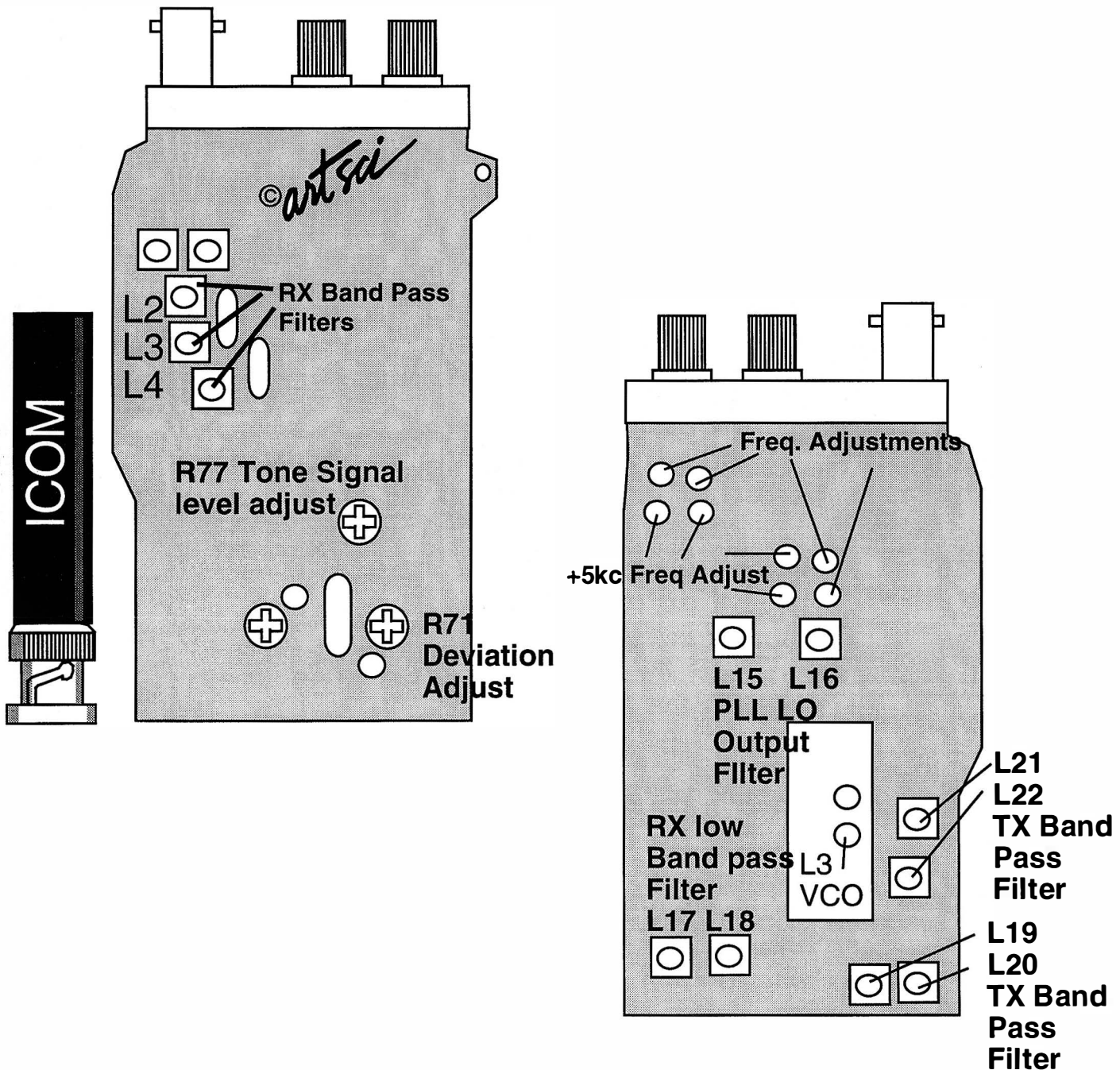


Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

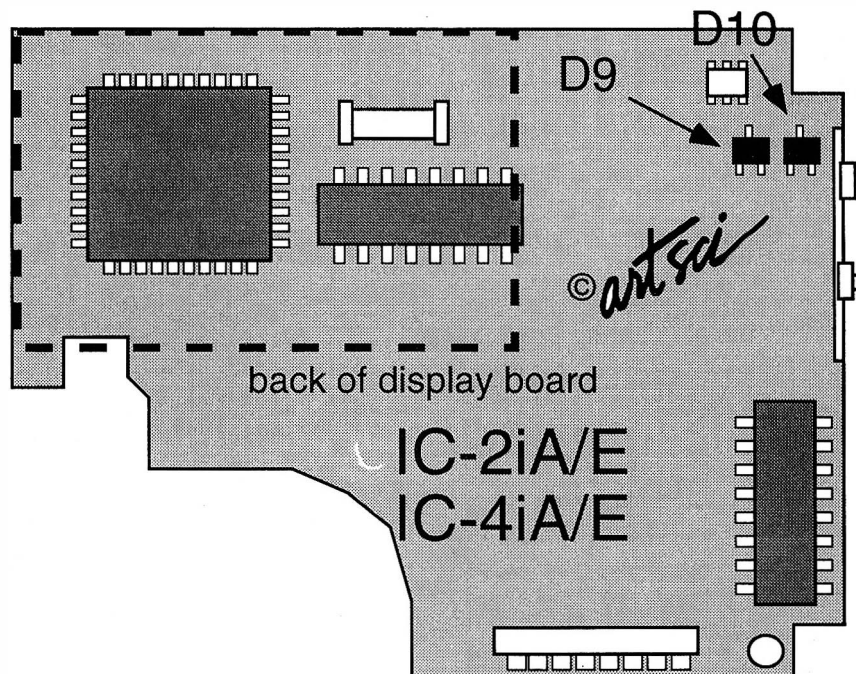




IC-2iA/E Expansion Range

118-136 MHz AM Receive
136-174 MHz FM Receive & Transmit

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



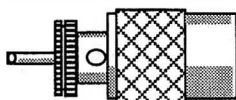
IC-4iA/E Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 420 - 469 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

Expanded RF Modification

1. Remove battery and antenna.
2. Remove screws and open radio.
3. Locate and **remove chip diode D9**.
(Be careful, do not over heat or lift traces)
4. **Install a Chip diode in position D10.**
(MA132K - ICOM part # 1790000820)
5. Reassemble the radio.
6. Reset the microprocessor, if needed
(see users manual for reset instructions)



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

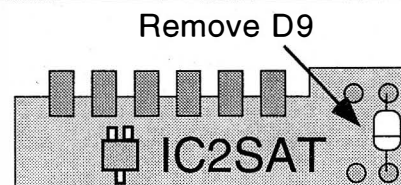
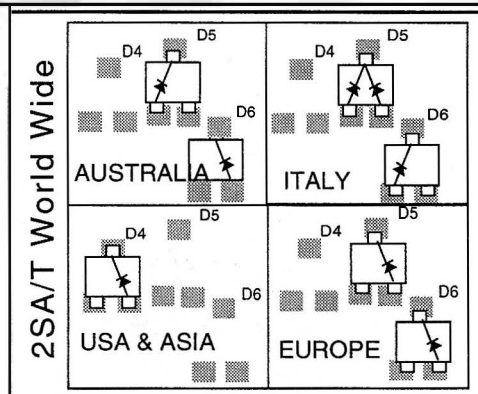
IC-2SA/T
IC-3SAT
IC-4SA/T

Expansion Range

2SAT Range: RX 108-140 AM, 138-169 FM, 310-370 FM TX 139 - 163 FM

4SAT Range: TX/RX 435 MHz - 465 MHz (any 30 MHz segment from 400 - 490.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Optional Commands:

Push [LAMP] & [Keyboard Key, see below] and Power on.

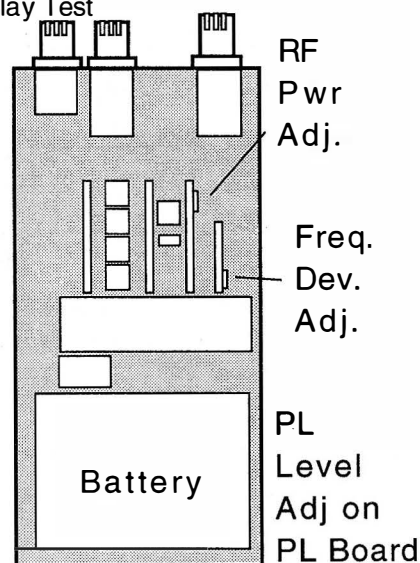
[1] Enter 4 digits, [2] Enter 5 digits, [3] Enter 6 digits,

[4] Pause Scan, [5] to see timer scan, [7] PS off

[8] PS 1:4 125 msec on/500msec off, [9] PS 1:16

[0] PTT Disable, [*] PTT Enable, [#] PTT Disable

[A] Reset, [D] Display Test



Expanded RF Modification

1. Remove battery and antenna.
2. Remove screws and open radio.
3. Locate and **remove diode D9** on LOGIC A unit (Already removed on USA version)
4. **Remove chip diode D6.** (Already removed on USA version)
5. Solder **install a chip diode (DA114)** in place of D6 position. A 1N4148 or other diode can be used if extreme caution is taken.
6. Reassemble the radio.
7. Reset the microprocessor.
(2SAT: Press & hold [#], [B] & Light, Turn power on)

Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

Receive and Transmit Expansion

ICOM

Expansion Range

126 MHz - 190 MHz

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

IC-2SRA
IC-4SRA

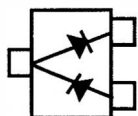
1. Remove
Screws

2. Remove PL

3. Remove Plate

4. Unscrew deck screws

DA133

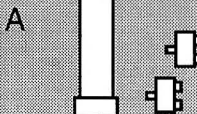


IC-2SRA
IC-4SRA

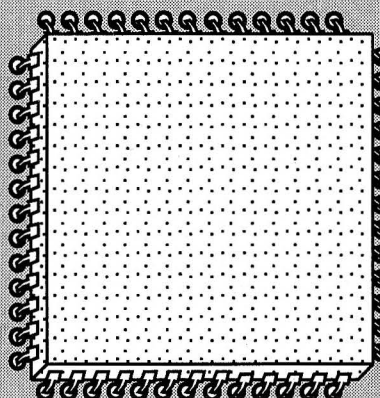
4SRA
INSTALL



2SRA
INSTALL



© artsci



LOGIC UNIT

RX Keyboard Expansion:

Press & Hold [CALL] & [F] & [LIGHT] & turn power on
Press & Hold [5] & [B] & [CLR] & turn power on

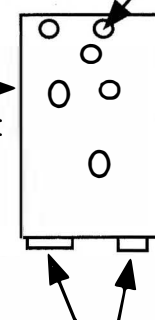


Expanded RF Modification

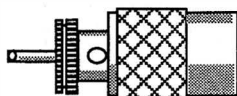
1. Remove battery and antenna.
2. Remove screws from back panel and battery plate and open radio.
3. Remove PL deck and power plate.
4. Unplug VHF & Receiver decks.
5. 2 SRA - **Attach Chip diodes** to location point D16 point A (MA133).
4 SRA - **Attach Chip diodes** to location point D19 point B (MA133).
(Diode MA133 - ICOM part # 1790000860)
6. Reassemble the radio.
7. **Reset the CPU**
(Push and hold [FUNCTION] & [A] & [CLR] and turn radio on)

RF Deck Dev.

RF
Adjust



Connectors



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

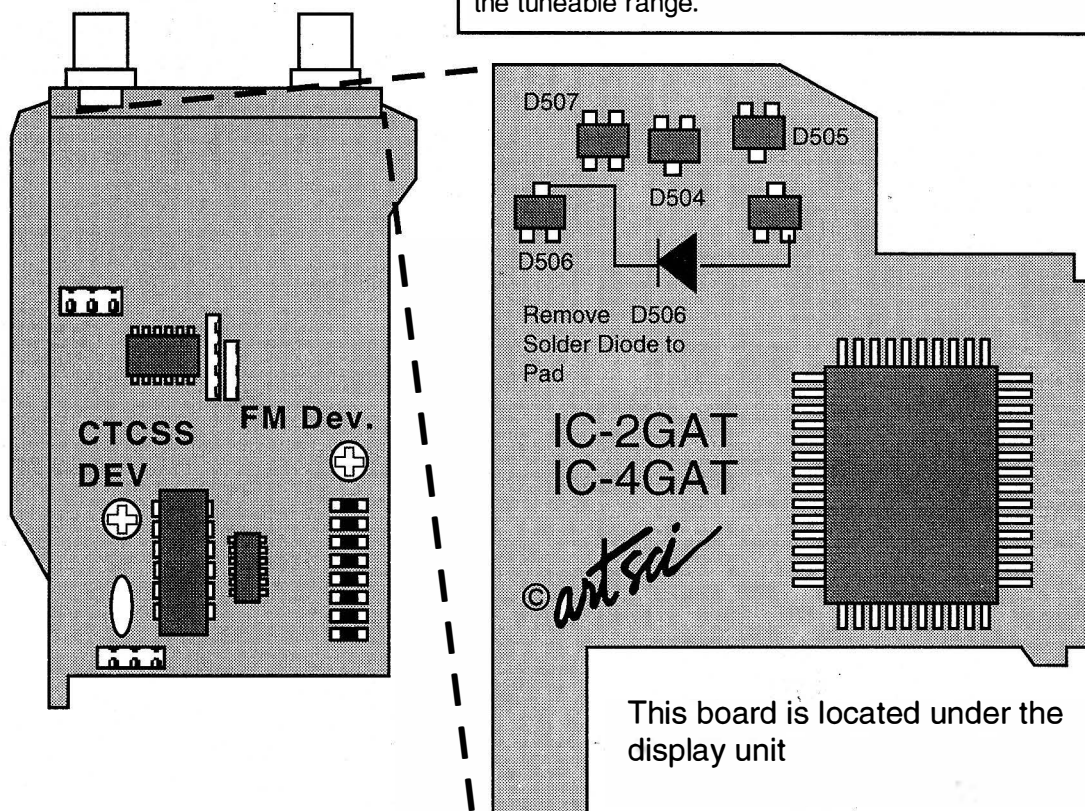
ICOM - 7

IC-2GAT
IC-4GAT

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Remove battery and antenna.
2. Remove screws and open radio
3. **Remove D506** (this part is already removed on US version)
4. **Attach diode as shown** (Use 1N914 or equivalent Diode)
Make sure Diode leads will not short anything. Cover them in tape.
5. Reassemble the radio
6. Reset the radio.
(Turn radio on, Hold [LIGHT] & [FUNCTION], turn radio off and on)

Radio/Tech Modifications Volume A

Receive and Transmit Expansion

ICOM
IC-2GXAT

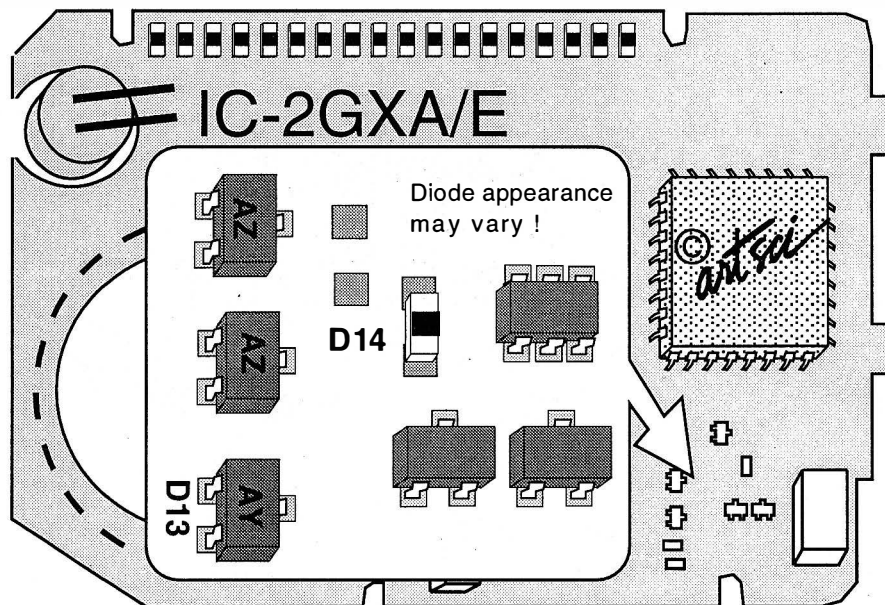
Expansion Range

136Mhz - 180Mhz.

The usable frequency range is 138 MHz to 174 MHz, but the frequency display is from 50-200 MHz

Reports say that the RX sensitivity is poor around 138 MHz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

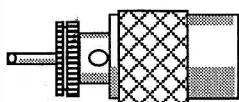


Expanded RF Modification

1. Remove battery and antenna.
2. Remove screws and open radio
3. Locate Logic Unit.
4. Locate and **remove Diode D13** (RX Mod).
5. Locate and **remove Diode D14** (TX Mod).
6. Reassemble the radio
7. If required, reset the microprocessor.
(Press and hold [FUNC] & [V/MC] & [HL LOCK] & [DUP] and turn the Power on)
or (Press and hold [FUNC] & [V/MC] & [HL LOCK] & [#] and turn the Power on)

OPTIONAL KEYBOARD RX MOD -

Press and hold [FUNC] & [SCAN] & [DUP] and turn power on.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

ICOM - 9

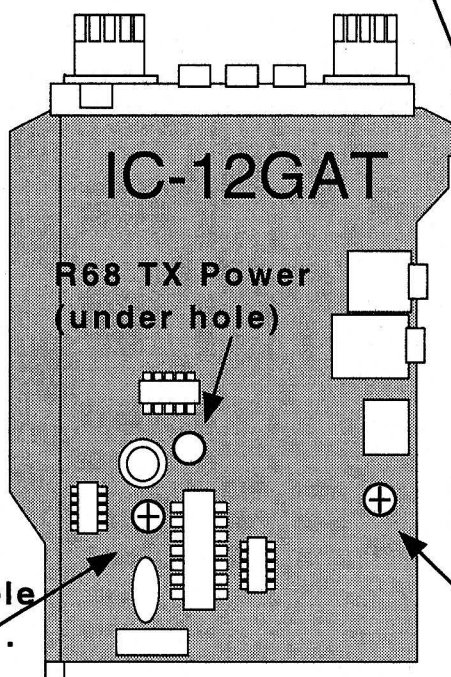
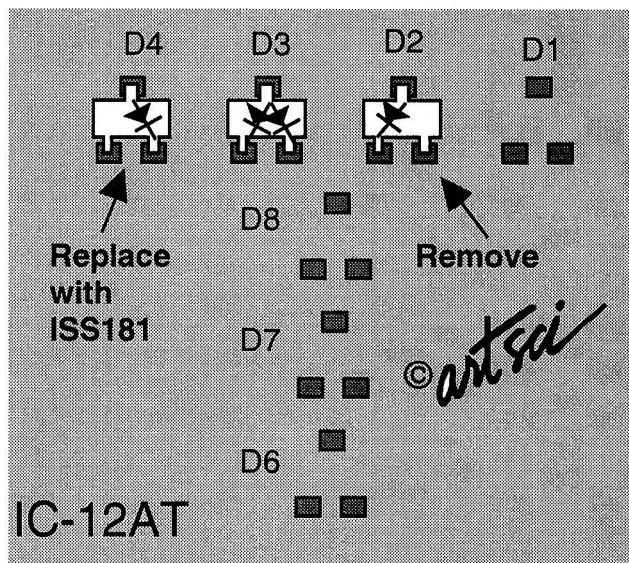
ICOM

Receive and Transmit Expansion

IC-12AT
IC-12GAT

IC-12AT Expanded RF Modification

1. Remove battery and antenna.
2. Remove Screws and open radio.
3. Locate and **remove diode D2** (See Drawing)
4. **Replace diode D4** with ISS 181 (A3)
5. Reassemble the radio.
6. Reset the microprocessor.
(Hold [FUNCTION] and turn power on)



Alignment Controls

Radio/Tech Modifications Volume A

ICOM - 10

Photocopies are a violation of copyright law. © artsci inc. all rights reserved. Have the original book with you when you call with a question. **Use at your own Risk!** The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules. (818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

Radio/Tech Modifications

Frequency report

[illegible]

Expansion Range

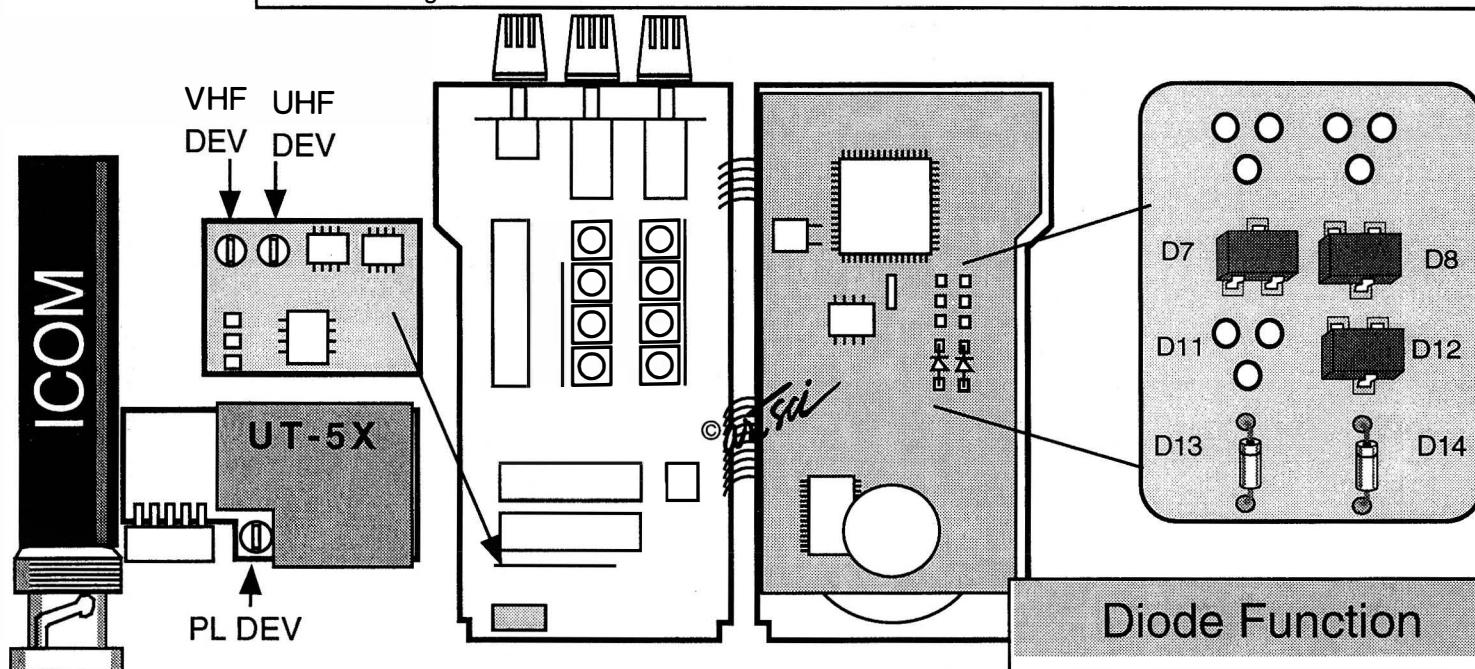
114 Mhz - 130 Mhz RX & 138 MHz - 192 MHz TX/RX

403 MHz - 485 MHz. TX/RX

825 MHz - 902 MHz RX

Note: When Transmitting in the 825-900 MHz range, the unit is simultaneously transmitting in the 400-450 MHz band!!

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Remove battery and antenna
2. Remove Screws and open radio
3. **Remove Diode D8.**
4. **Remove Diode D14** (Crossband Repeater)
5. **Remove Diode D13** (Expanded RX)
6. **Attach Diode DA204u to position D7**
7. **Attach Diode DA202u to position D12.** Note some models require a DA204u.
8. Reassemble the radio.
9. **Reset the microprocessor.**

Press and hold [light] & [B] & [#] and turn power on.

Note: Press and hold [light] & [3] and turn power on for direct Freq. entry.

[light] & [2] will reset the radio for 10 MHz input operation.

D7 is a DA204U.

ICOM Part # 912-06015

D12 is a DA204U

(206) 454-8155 ICOM Parts Dept.

Diode Function

D5 & D6	Enable USA Operation
D7	Enable VHF expansion
D12	Enable UHF Expansion
D13	Disable RX Expansion
D14	Disable X band RPTR.

CROSS BAND REPEATER PROCEDURES (VFO MODES ONLY)

TURN ON - HOLD [FUNCTION] & PRESS [C] THEN [5] THEN [D]

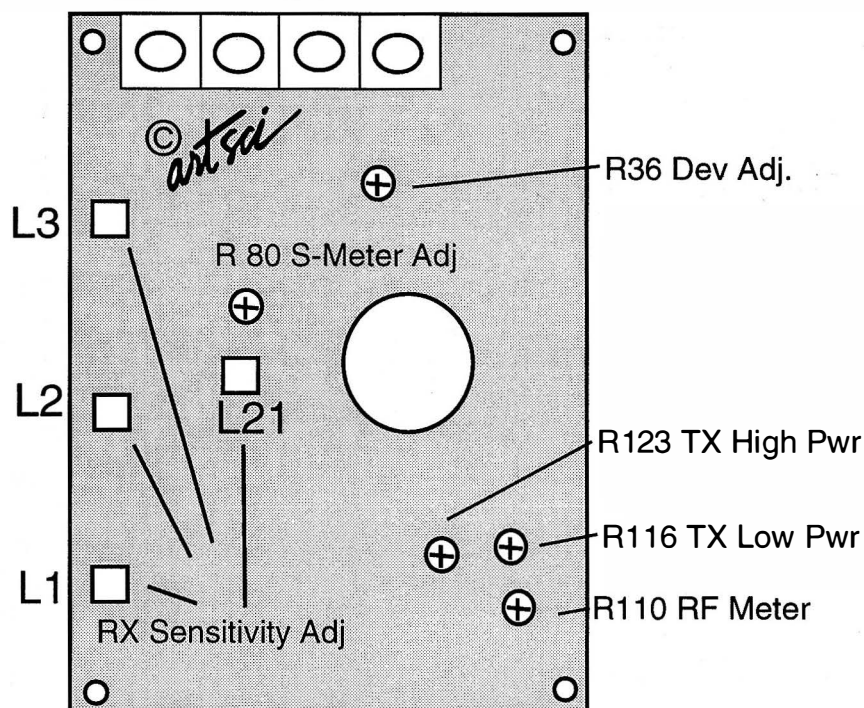
TURN OFF - HOLD [FUNCTION] & PRESS [D]

Radio/Tech Modifications Volume A

Expansion Range

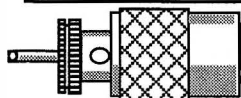
The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Set offset to 0.0
2. Select VFO (A).
3. Press and hold [SIMP/DUP] and [NOR/REV].
4. Dial in desired frequency.
5. Release [SIMP/DUP] button.
6. Select the other VFO (B).
7. Repeat steps 3, 4 and 5
 - If VFO (B) can not be set, transfer VFO (A) to VFO (B) using the [WRITE] button as described on page 7, item 6, of the owners manual.
 - (NOTE: [SIMP/DUP] button must be out when the VFO is changed)
8. If the tuning knob is turned again, the radio will revert back within the normal band range.



Radio/Tech Modifications Volume A

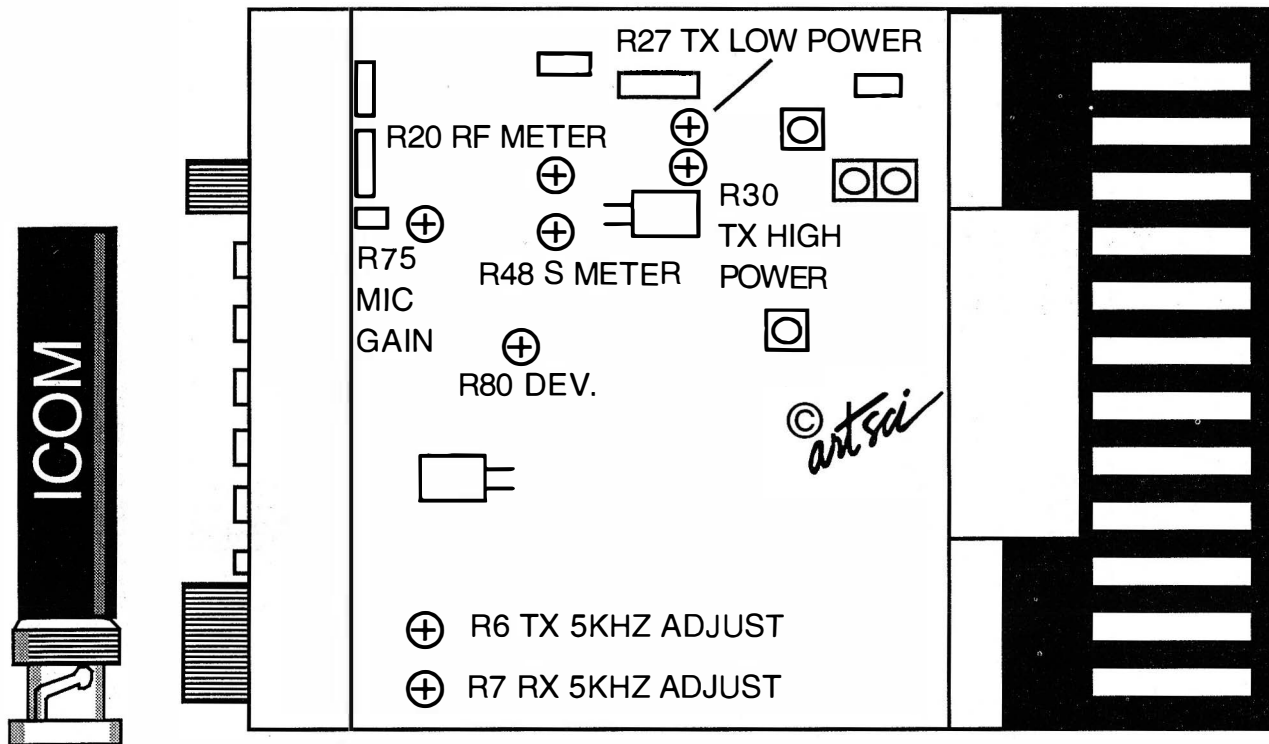
Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci



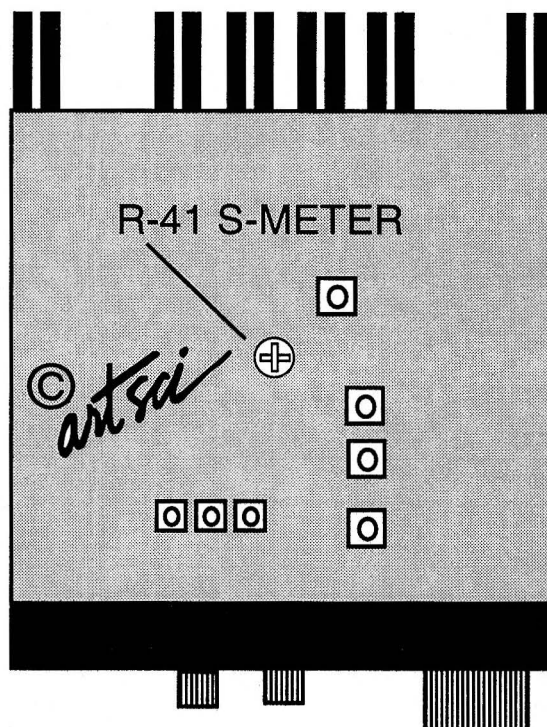
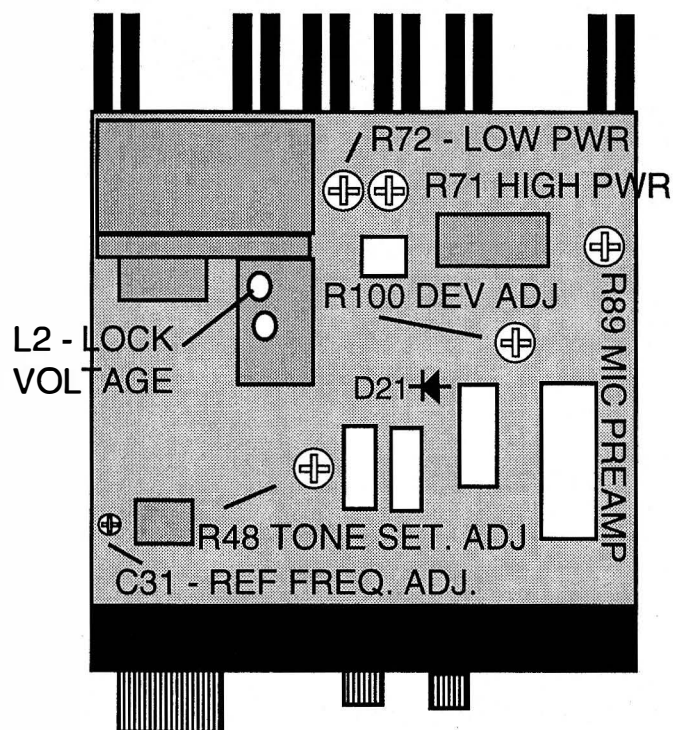
CPU Reset by pressing the Reset button under the access cover

Note: There is no way to add offset to IC-27 D boards

Expansion Range

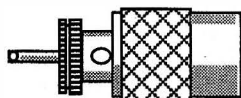
The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Remove Power and Antenna.
2. Remove screws and open case.
3. Locate and **cut Diode D21** inside the top of the circuit board.
4. **Reset the Microprocessor.**
(insert a toothpick in hole located in corner of bottom cover.)
5. Reassemble the radio.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

D909 1SS193 F3

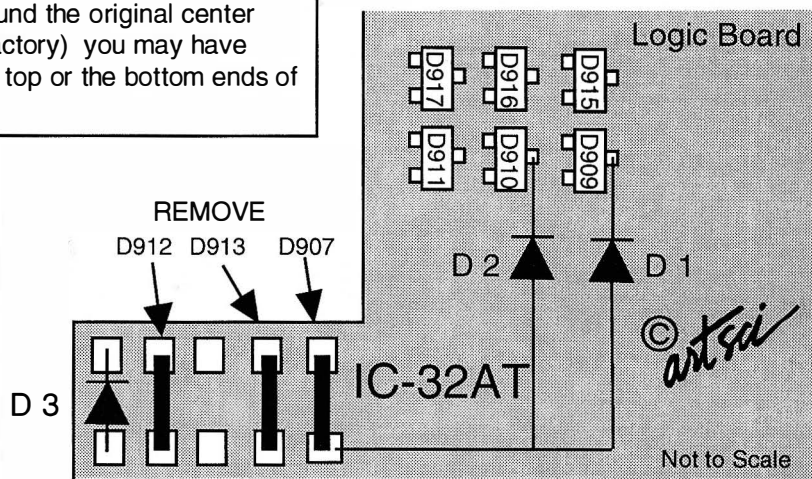
D910

D916 1SS196 G3

Alignment Information

Adjust C-510 to get .25 volts at UHF test point at lowest desired frequency.

C-510 is located in metal box. The test point is located next to the metal box.



Expanded RF Modification

1. Remove battery and antenna.
2. Remove Screws and open radio.
3. **Remove D-907** (150 MHz+)
(this part is already removed on US version)
4. **Add Diode #1** (1N914).
5. **Remove D913** (450 MHz+).
6. **Add Diode #2** (1N914).
7. **Add diode #3** (1N914) 10 MHz.
8. **Remove D-912** (Repeater mod).
9. Reset the microprocessor.
(HOLD [FUNCTION] & [A] & [LIGHT] and turn power on)
10. Reassemble the radio.

Cross Band Repeater Instructions

TURN ON - Press & Hold [Function], Press [C] key, Press [6] key, Press [D] key.
Release Function key.

TURN OFF - Press and Hold [Function], Press [D] key, Press [C] key.
Release [Function]

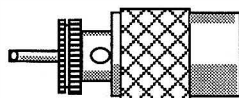
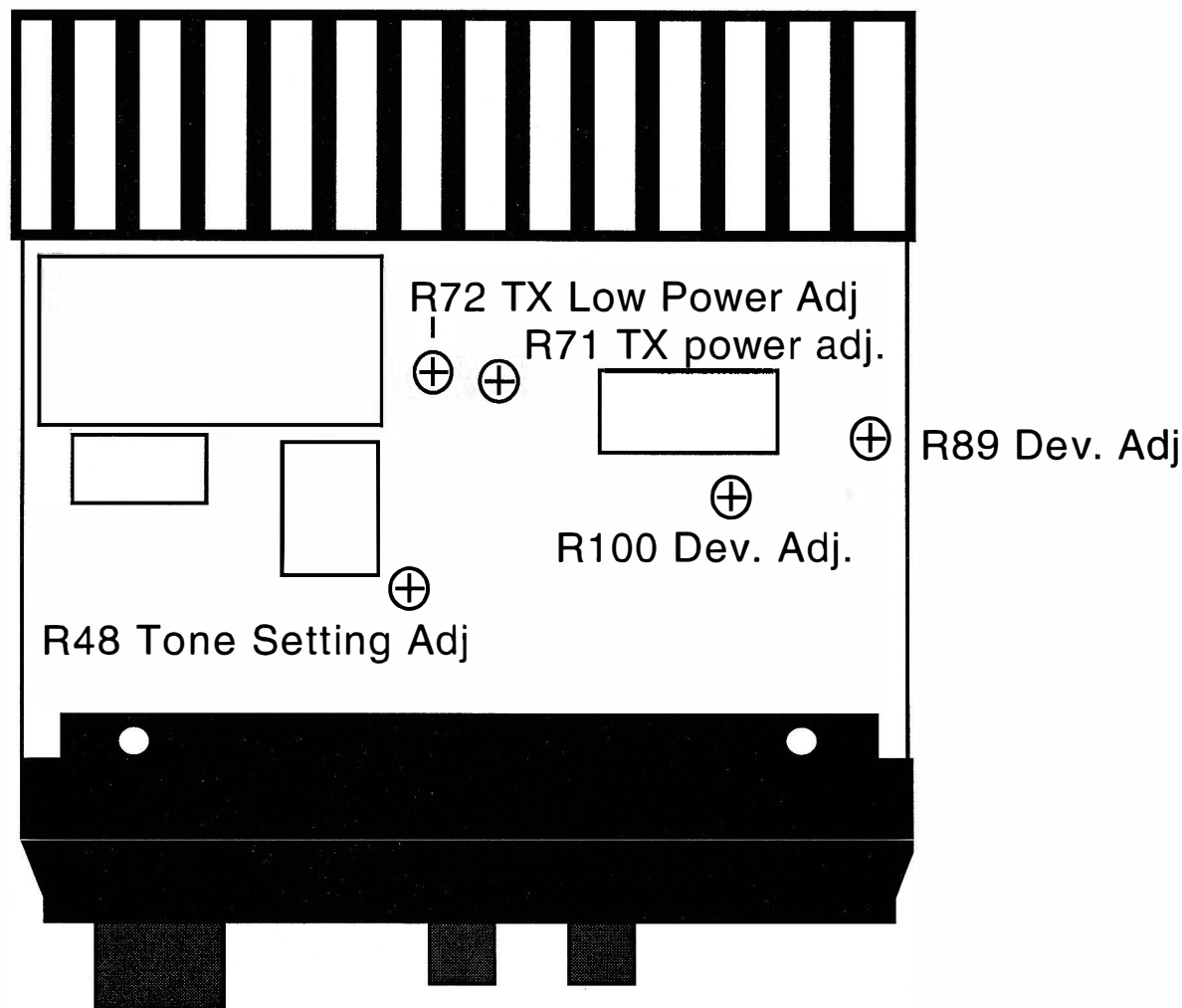
Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

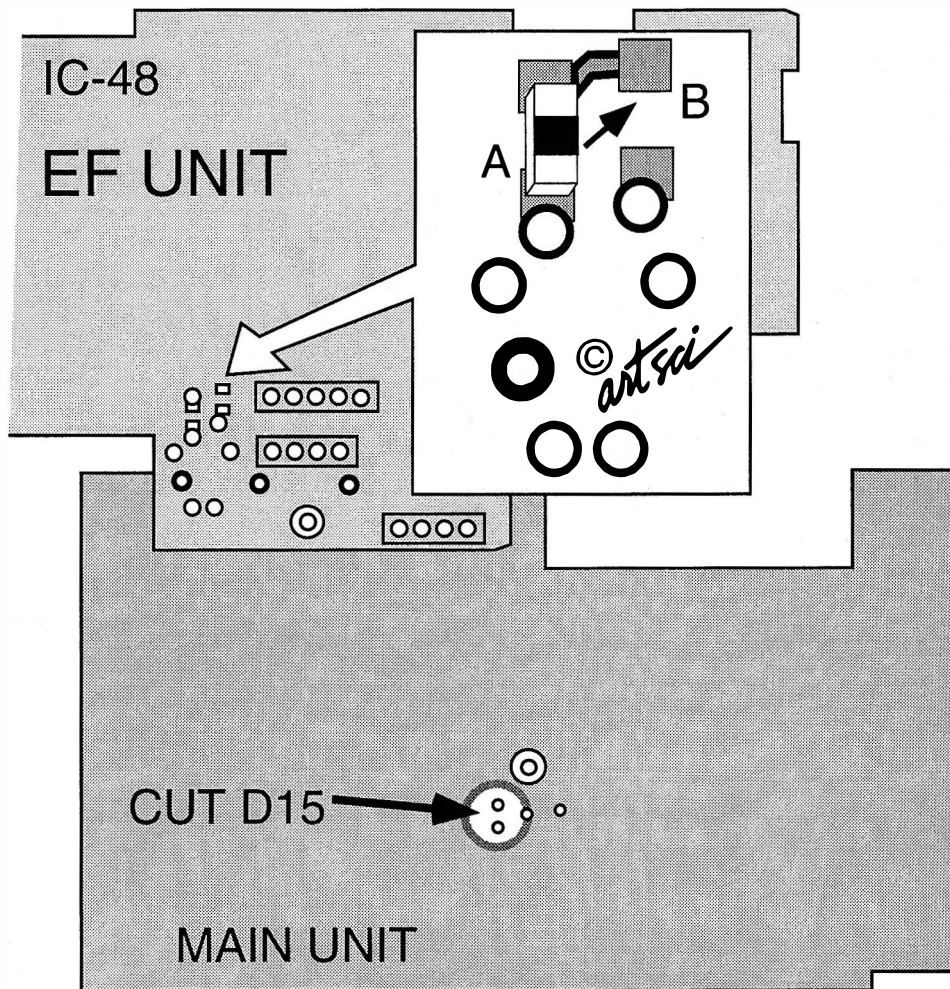
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations
caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

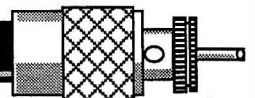


Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 420 - 469 Mhz. Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

Expanded RF Modification

1. Remove power and antenna.
2. Remove screws open case.
3. Locate R55 on EF unit.
4. Move **R55 from A to B.**
5. Locate and **cut D15** on the main unit.
6. Reassemble the radio.



Receive and Transmit Expansion

ICOM
IC-207H

USA version #.05

Expansion Range

118-135.995 MHz AM/FM RX
136-174 MHz TX/RX
320-399 MHz RX
400-479 MHz TX/RX
849-869 MHz RX
894-950 MHz RX

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



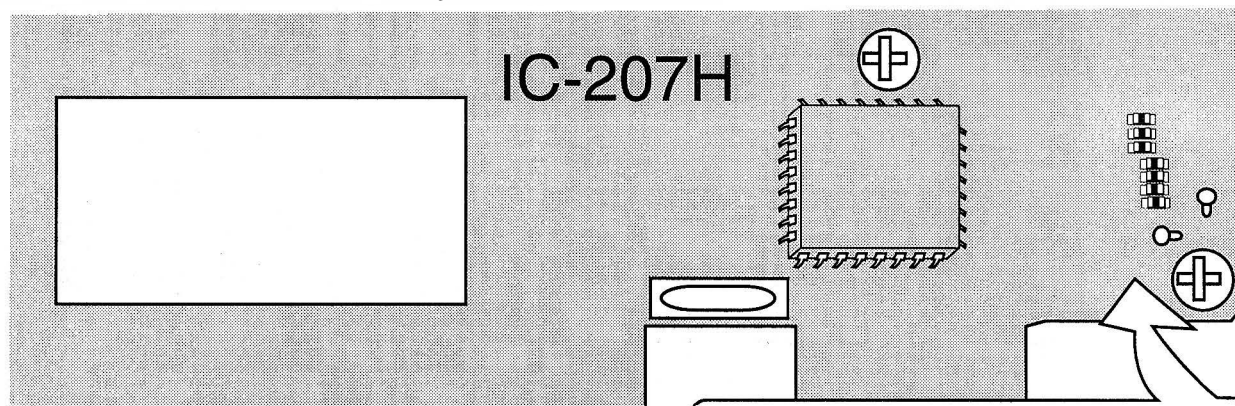
CAUTION:

This modification requires soldering or desoldering CMOS components. It requires special CMOS rated equipment and familiarity with surface mount soldering techniques.

ICOM

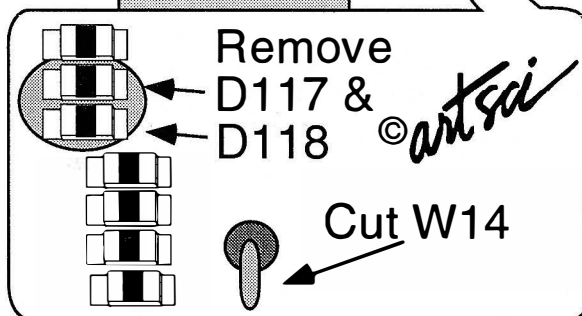
To Change receive mode:

Push [BAND] key four more than one second.
(120MHz & 320 MHz band only)

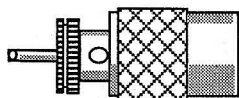


Expanded RF Modification

1. Remove power and antenna.
2. Remove screws open case.
3. Locate main unit
4. Locate and **remove chip diodes D117 & D118**
5. **Cut Jumper W14**
6. Reassemble the radio.
7. You may be required to reset the microprocessor. (see owners manual)



Note: All the diodes shown may not be present in your radio.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

ICOM - 19

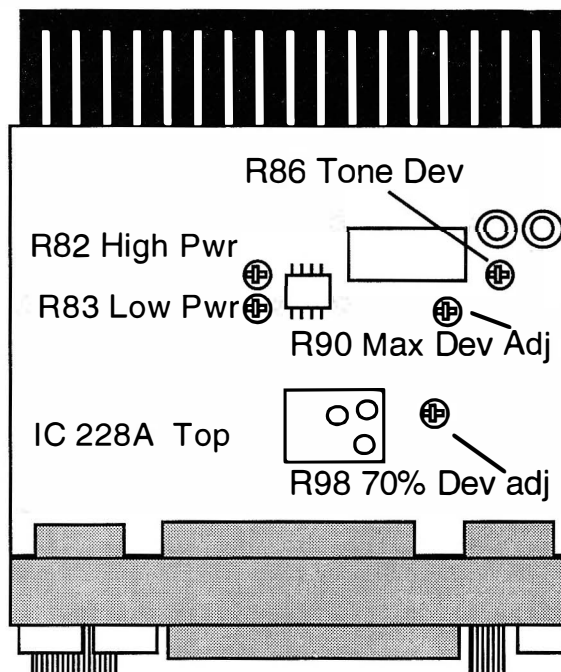
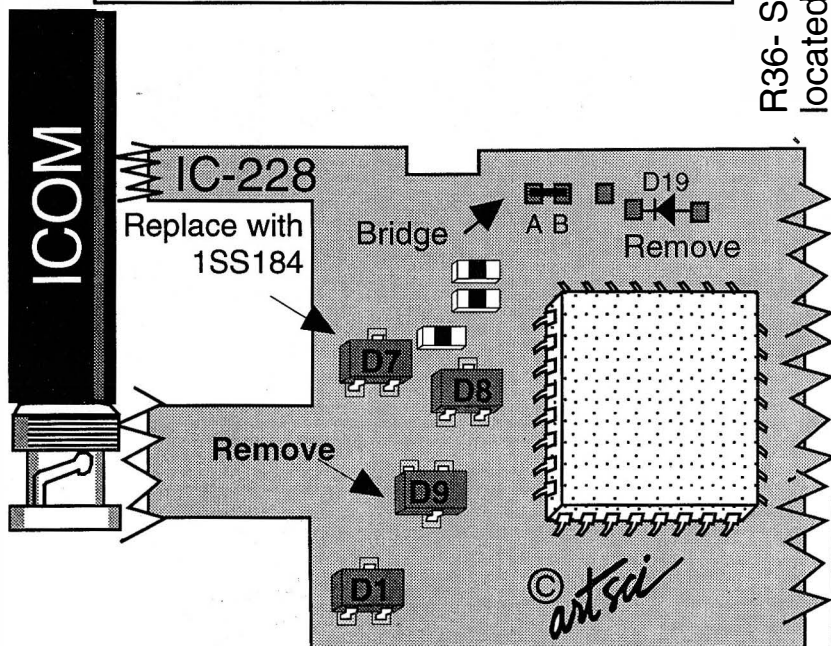
Note : Discriminator output on pin 9 of IC 1 (MC3357P)

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

R36- S-Meter Adj
located on bottom board



Expanded RF Modification

(228A Ser# <02900 & 228H Ser# <06300)

1. Remove power and antenna.
2. Remove screws open case of the EF Unit. (Control head).
3. **Remove diode D19**
4. **Replace chip diode D7 with an 1SS184)**
5. Reassemble the radio
6. **Reset the microprocessor**
(Push and hold [SQUELCH/Monitor] & [LOCK] and turn power on)

Expanded RF Modification

(228A Ser# >02900 & 228H Ser# >06300)

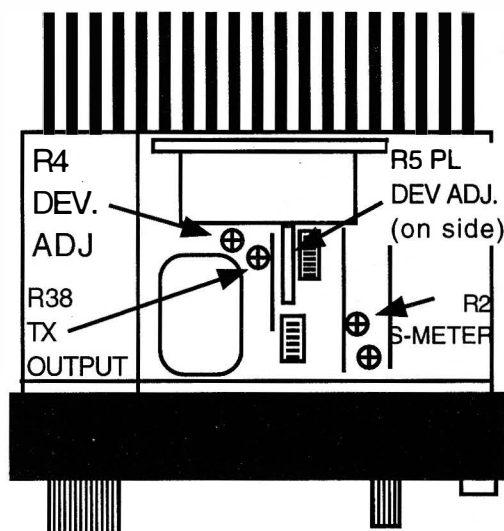
1. Remove power and antenna.
2. Remove screws open case of the EF Unit. (Control head).
3. **Remove diode D19**
4. **Remove chip diode D9**
5. **Solder bridge Pads A & B**
6. Reassemble the radio
7. **Reset the microprocessor**
(Push and hold [SQUELCH/Monitor] & [LOCK] and turn power on)

Expansion Range

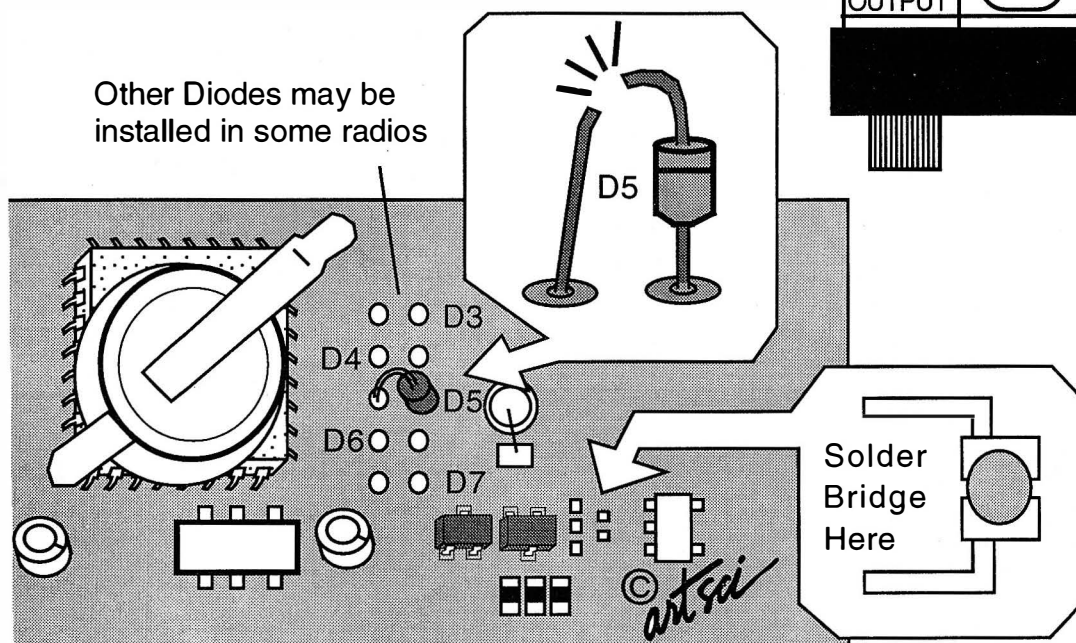
118.000 - 135.995 MHz (AM) RX
136.000 - 174.000 MHz (FM) RX

136.000 - 174.000 MHz (FM) TX

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

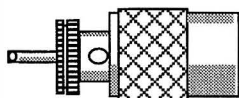


Other Diodes may be installed in some radios



Expanded RF Modification

1. Remove power and antenna.
2. Remove screws open case.
3. Open the front control panel and expose the logic board.
4. Locate and **cut Diode D5** on the LOGIC board
5. **Install a jumper at "land" point.**
6. Reassemble the radio.
7. **Reset the microprocessor.**
(Press and hold [SET] & [MW] and turn power on)



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

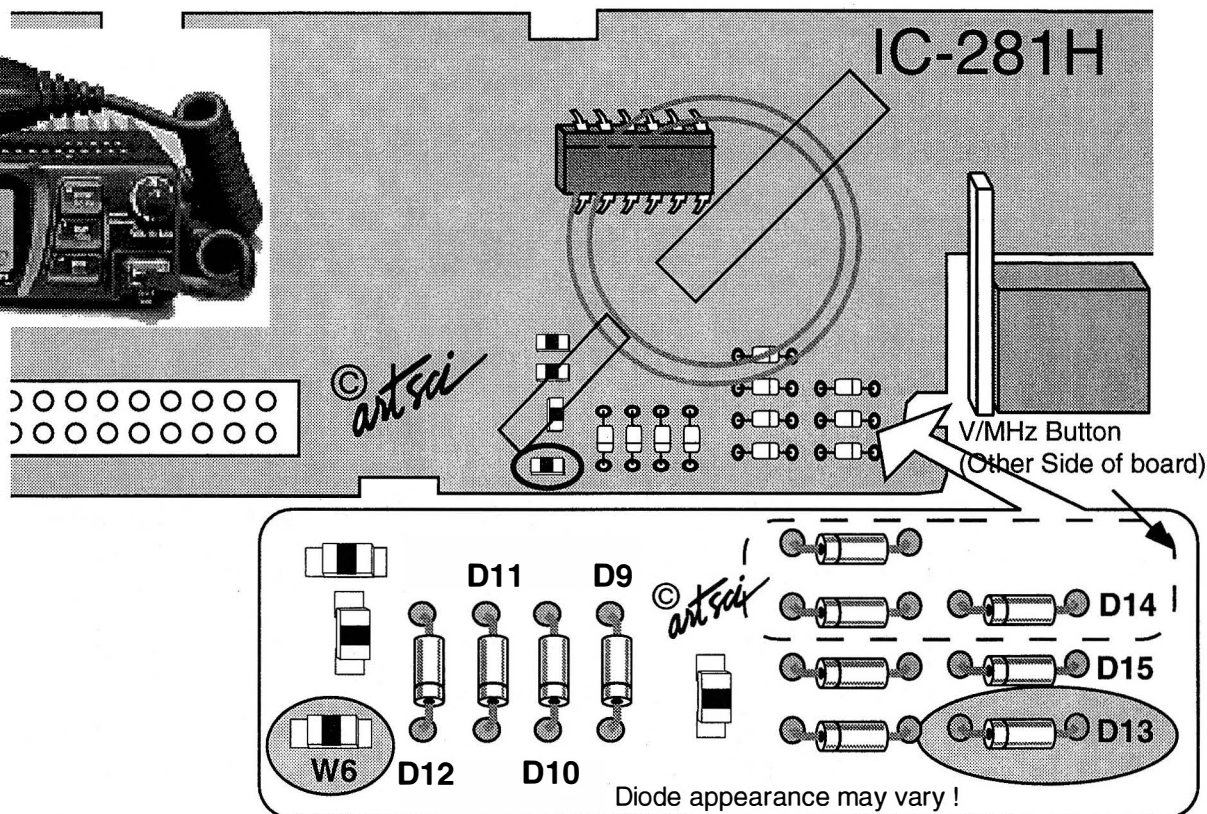
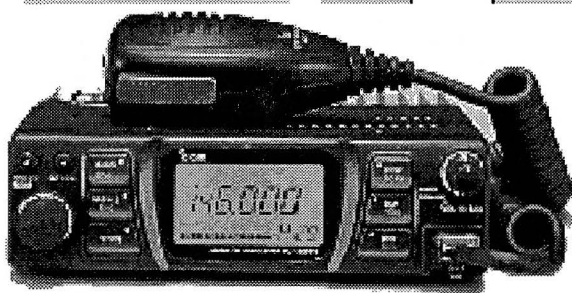
© artsci

ICOM

IC-281

IC-481

Receive and Transmit Expansion Cross Band Repeater



Expansion Range

118-135.995 MHz AM RX
136-174 MHz TX/RX
320-479 MHz RX
400-479 MHz TX (IC-481)

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

Expanded RF Modification

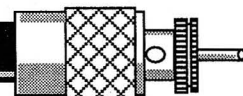
1. Remove power and antenna.
2. Remove screws open case.
3. Locate logic board.
4. Locate and **remove jumper W6 (RX Mod)**
5. Locate and **cut Diode D13.**
6. Reassemble the radio.
7. You may be required to reset the microprocessor. (see owners manual)

Cross Band Instructions

1. Enter desired Frequences in both bands

ON: In UHF Mode Press [SET] & [LOCK] until 'L' Flashes.
OFF: Press [SET] & [LOCK].

Radio/Tech Modifications Volume A



© artsci

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

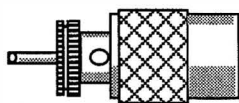
Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

Expanded RF Modification Keyboard Modification

1. Set the offset to 0.0
2. Select "DUPLEX" mode (+ or -).
3. Select a VFO.
4. Press and hold the [WRITE] button.
5. Dial the desired frequency.
6. Release the [WRITE] button.
7. If desired, repeat the above steps for the other VFO.
8. Set offset back to 0.6
9. When changing frequency, remember to hold down the [WRITE] button or the display will revert back to within the normal band limits.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© *artsci*

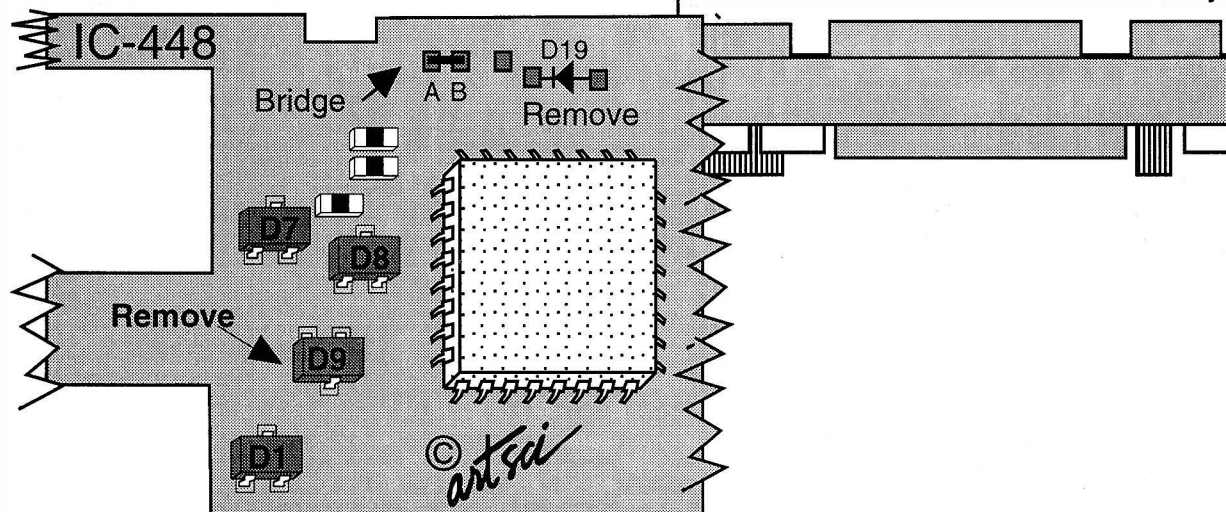
Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 420 MHz - 469 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

Note : Discriminator output on pin 9 of IC 1 (MC3357P)

R36- S-Meter Adj
located on bottom board



Expanded RF Modification

1. Remove power and antenna.
2. Remove screws and open the case.
3. **Remove diode D19.**
4. **Remove chip diode D9.**
5. **Solder bridge Pads A & B.**
6. Reassemble the radio.
7. **Reset the microprocessor.**
(Push and hold [SQUELCH/MONITOR] & [LOCK] and turn power on.

Radio/Tech Modifications Volume A

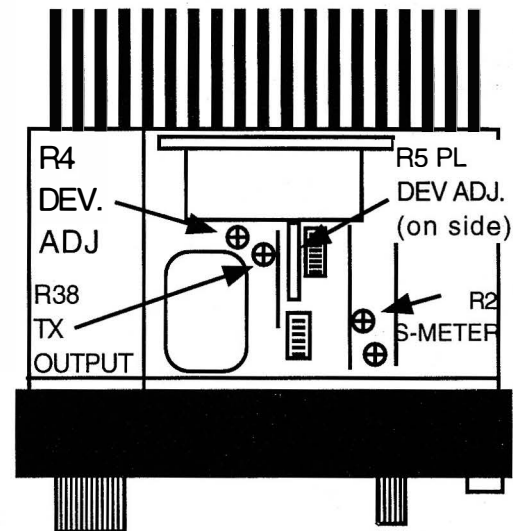
©artsci

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

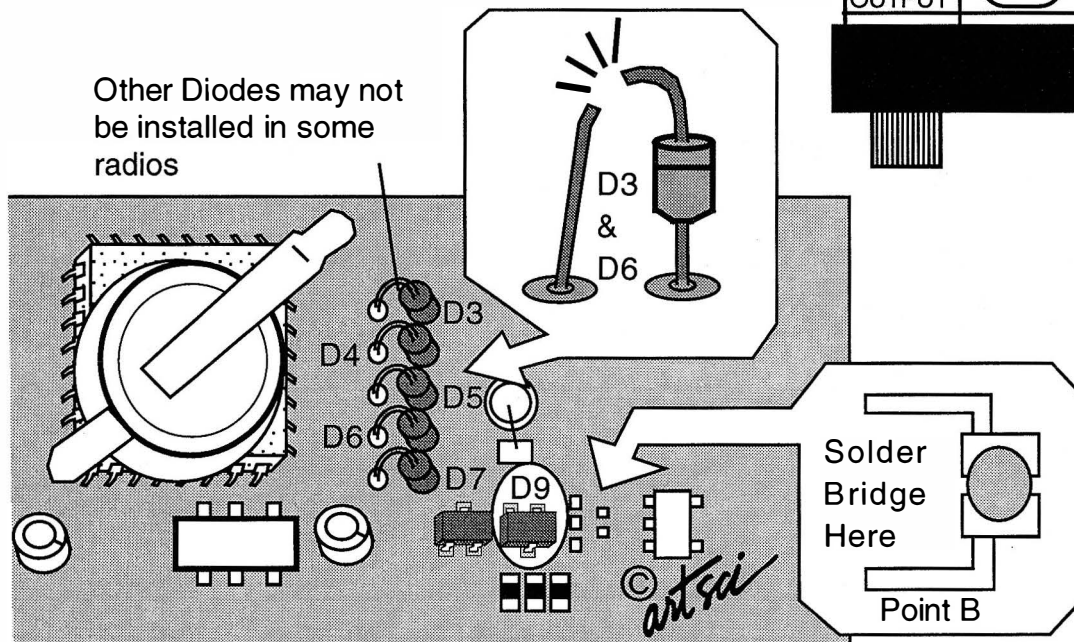
Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 420 MHz - 469 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

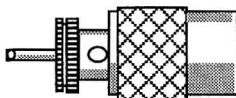


Other Diodes may not be installed in some radios



Expanded RF Modification

1. Remove power and antenna.
2. Remove screws and open the case.
3. Locate and **short "point B"**.
4. Locate and **cut diode D3**.
5. Locate and **cut diode D6**.
6. **Install diode D9 (1SS187)**.
7. Reassemble the radio.
8. **Reset the microprocessor**
(Press and hold [SET] & [MW] and turn power on.)



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

Performance Report

Radio _____

Date _____

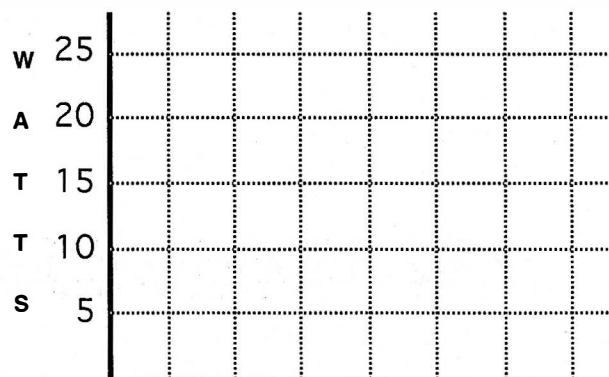
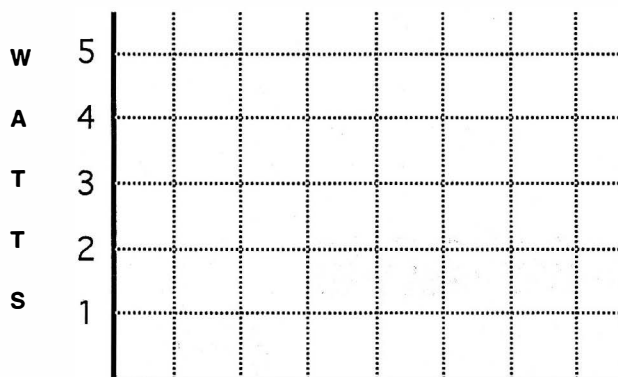
Owner : Name _____

Address _____

City _____ St. _____ Zip _____

Phone () - _____

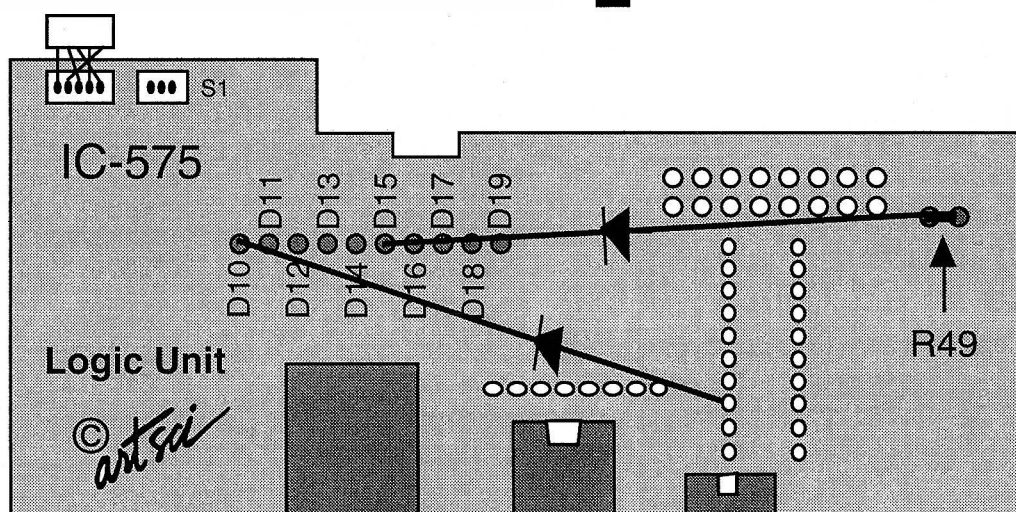
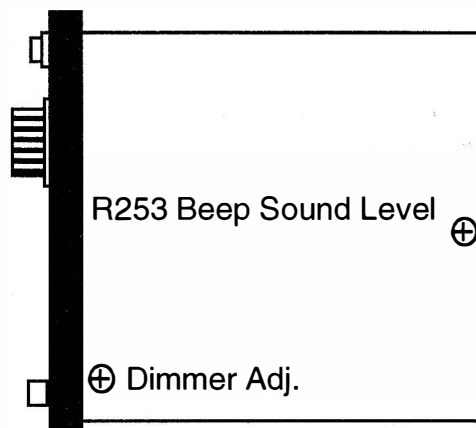
Description	Before	After
Power out (Low)	_____ Watts	_____ Watts
Power out (High)	_____ Watts	_____ Watts
Frequency Error (Simplex)	_____ Hz	_____ Hz
Frequency Error (Offset)	_____ Hz	_____ Hz
Receive Sensitivity (Mid-band)	_____ uv	_____ uv
Receive Sensitivity (_____ MHz)	_____ uv	_____ uv
Receive Sensitivity (_____ MHz)	_____ uv	_____ uv
PL Deviation	_____ Hz	_____ Hz
DTMF Deviation	_____ KHz	_____ KHz
Audio Deviation	_____ KHz	_____ KHz
Lowest usable Freq @ .5 Pwr	_____ MHz	_____ MHz
Highest usable Freq @ .5 Pwr	_____ MHz	_____ MHz



Expansion Range

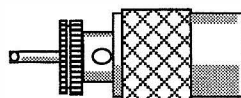
RX 26 - 56 MHz
TX 26 - 56 MHz

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Remove power and antenna.
2. Remove screws open case.
3. Locate the Logic Unit. It is located under the PA unit.
(the PA unit has the speaker in it.)
Follow the instruction used when installing the UT-34 Tone Squelch unit.
4. **Attach two diodes as shown.** (any standard diode 1N914 etc.)
D10 to 3rd pin & R49 to D15
5. Reassemble the radio.
6. **Reset the microprocessor** (Press and hold [M-CL] and turn power on)



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

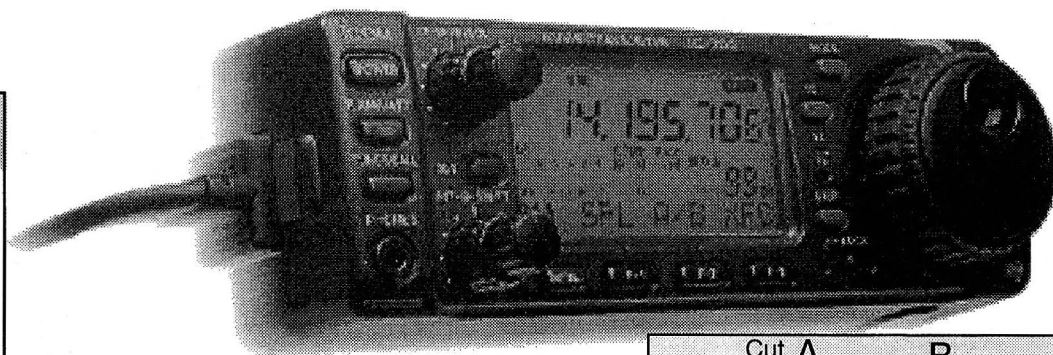
ICOM

IC-706

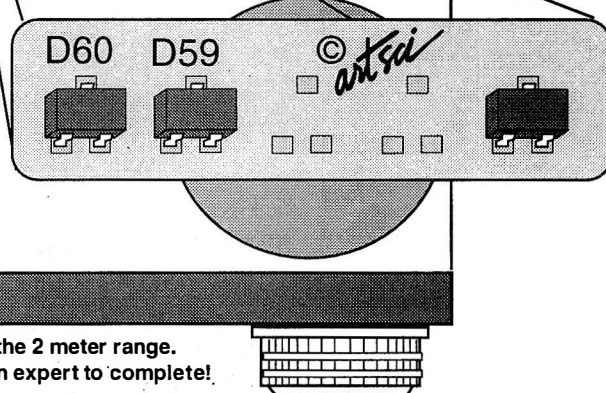
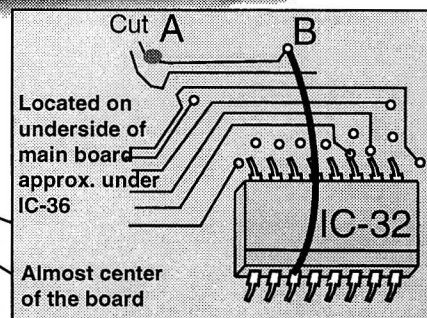
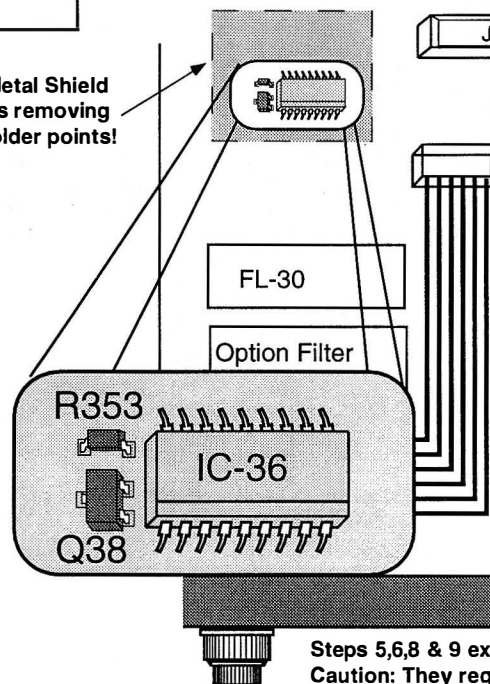
Receive and Transmit Expansion

Expansion Range

The reported range of this radio is 1.66 MHz - 54 MHz & 118 MHz - 172 MHz. Some reports show the range to be 1.8 Mhz continuous to 200 MHz. The repeater offset is limited to 4 MHz maximum!!!



Under Metal Shield
Requires removing
30-40 solder points!



Steps 5,6,8 & 9 expand the 2 meter range.
Caution: They require an expert to complete!

Expanded RF Modification

1. Remove power and antenna.
2. Remove screws.
3. Remove top cover.
4. Locate and **remove Diode D59** (HF & 6 meters)
5. Locate and **cut the yellow wire** on connector J4
Left hand side yellow wire, fourth from the left
(2 meter sensitively fix)

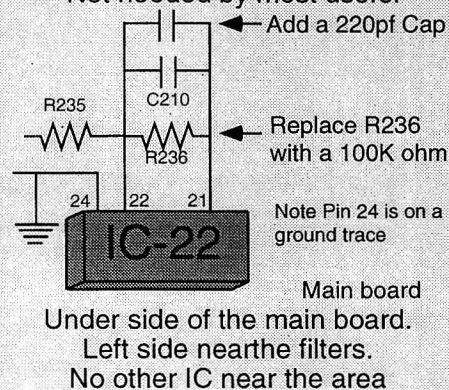
--- Expand TX on 2 meter band ---

The following steps will require you to remove the main board

6. Locate and **remove Diode Q38** (under shield)
7. Locate and **remove jumper R353**
8. **Cut PC board at point "A"** (bottom of board)
9. **Add jumper from point "B"** to pin 11 of IC32.
10. Reassemble the radio.

Low TX Audio FIX

Not needed by most users!



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST, Fax:(818) 846-2298

E-mail - artsci@artscipub.com / URL <http://www.artscipub.com>

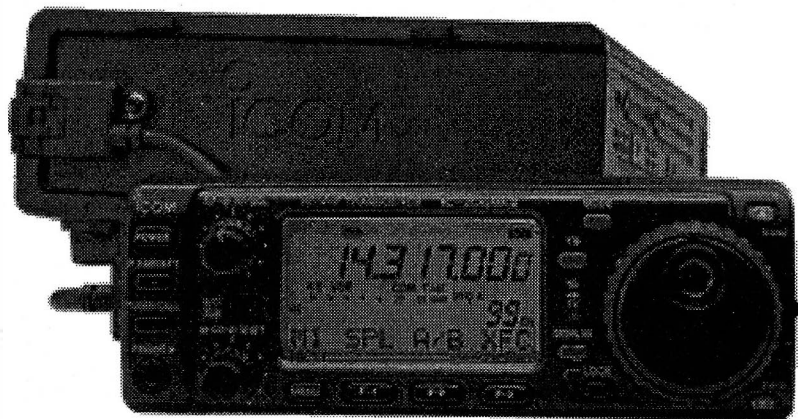
© artsci

Receive and Transmit Expansion

ICOM
IC-706MK2

Expansion Range

The reported range of this radio is 1.66 MHz - 54 MHz & 118 MHz - 172 MHz.
Some reports show the range to be 1.8 Mhz continuous to 200 MHz.

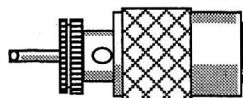
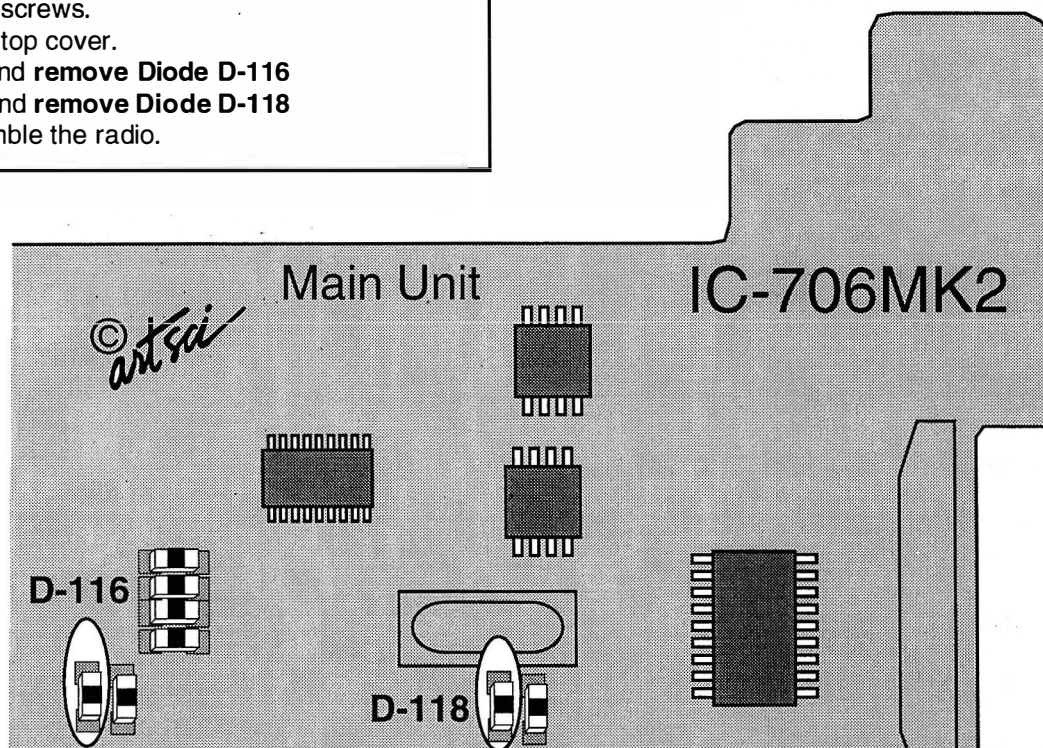


CAUTION:

This modification requires soldering or desoldering CMOS components. It requires special CMOS rated equipment and familiarity with surface mount soldering techniques.

Expanded RF Modification

1. Remove power and antenna.
2. Remove screws.
3. Remove top cover.
4. Locate and **remove Diode D-116**
5. Locate and **remove Diode D-118**
6. Reassemble the radio.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

ICOM - 29

Performance Report

Radio _____

Date _____

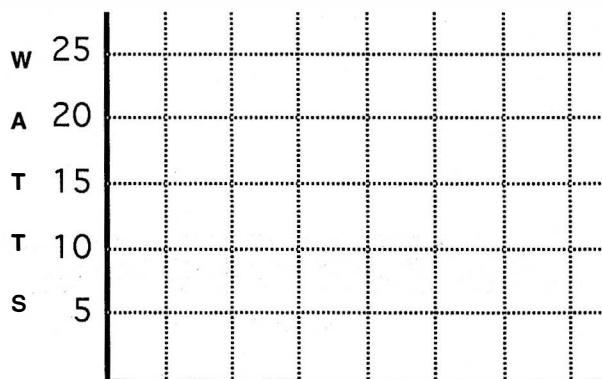
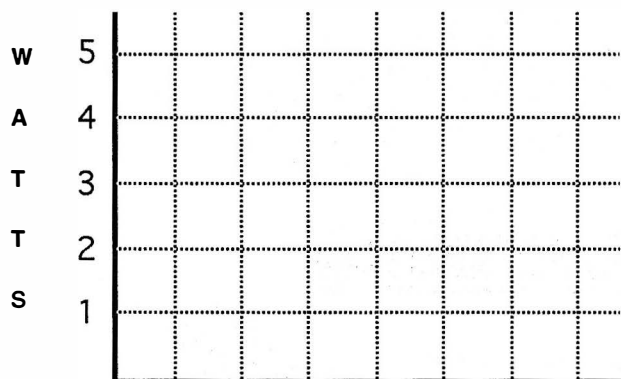
Owner : Name _____

Address _____

City _____ St. _____ Zip _____

Phone () - _____

Description	Before	After
Power out (Low)	_____ Watts	_____ Watts
Power out (High)	_____ Watts	_____ Watts
Frequency Error (Simplex)	_____ Hz	_____ Hz
Frequency Error (Offset)	_____ Hz	_____ Hz
Receive Sensitivity (Mid-band)	_____ uv	_____ uv
Receive Sensitivity (____ MHz)	_____ uv	_____ uv
Receive Sensitivity (____ MHz)	_____ uv	_____ uv
PL Deviation	_____ Hz	_____ Hz
DTMF Deviation	_____ KHz	_____ KHz
Audio Deviation	_____ KHz	_____ KHz
Lowest usable Freq @ .5 Pwr	_____ MHz	_____ MHz
Highest usable Freq @ .5 Pwr	_____ MHz	_____ MHz





CAUTION:

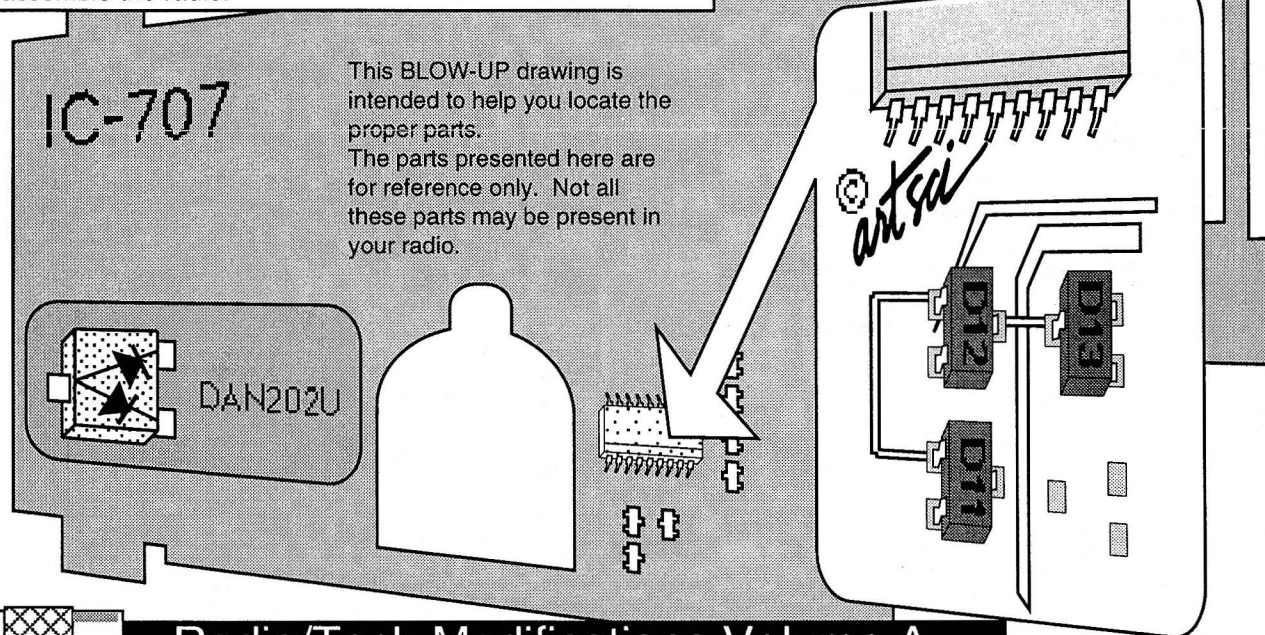
This modification requires soldering or desoldering CMOS components. It requires special CMOS rated equipment and familiarity with surface mount soldering techniques.

Expanded RF Modification

1. Remove power and antenna.
2. Remove screws open case.
3. Locate Front Unit board.
4. Determine the version of the radio your have.
 - Version 1:** Locate and **remove Diode D12**
 - Version 2:** Locate and **remove Diode D13.**
 - Version 3:** Locate and **remove Diode D12**
Add Diodes D11 and D13
(ICOM # DAN202U, Symbol on diode "U")
 - Version 4:** Locate and **remove Diodes D12 and D13.**
5. Reassemble the radio.

Expansion Range

1.6 - 30 MHz



Radio/Tech Modifications Volume A

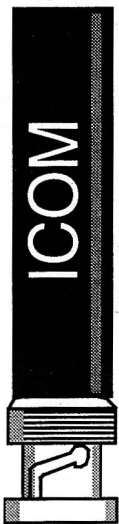
Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

Expansion Range

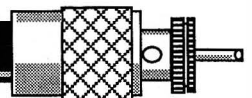
The Exact range of this radio is not know as of press time.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



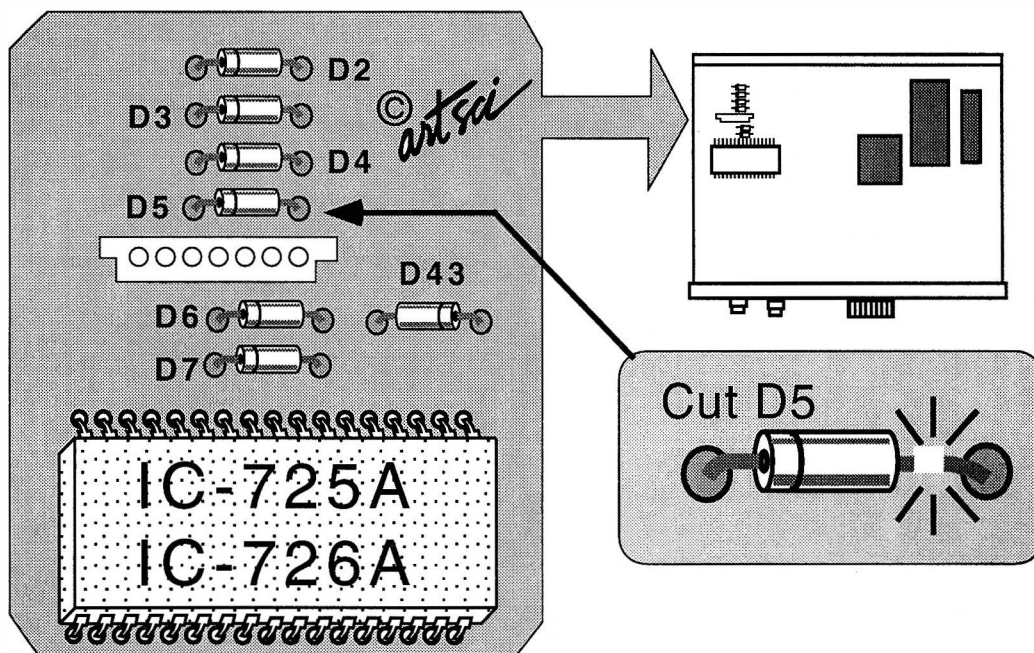
Expanded RF Modification

1. Remove power and antenna.
2. Remove screws open case.
3. Locate main board and **cut light blue wire, pin 1 of plug J-10**
4. Reset the Microprocessor.
(see owners manual)
5. Reassemble the radio.



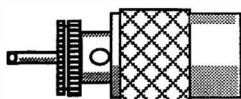
Expansion Range

The Exact range of this radio is not know as of press time. However there is no 50 MHz expansion
Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Remove power and antenna.
2. Remove screws open case.
3. Locate PLL board and **cut diode D5.**
4. **Reset the microprocessor.**
(Hold [FUNCTION] & [MW] and turn power on)
5. Reassemble the radio.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

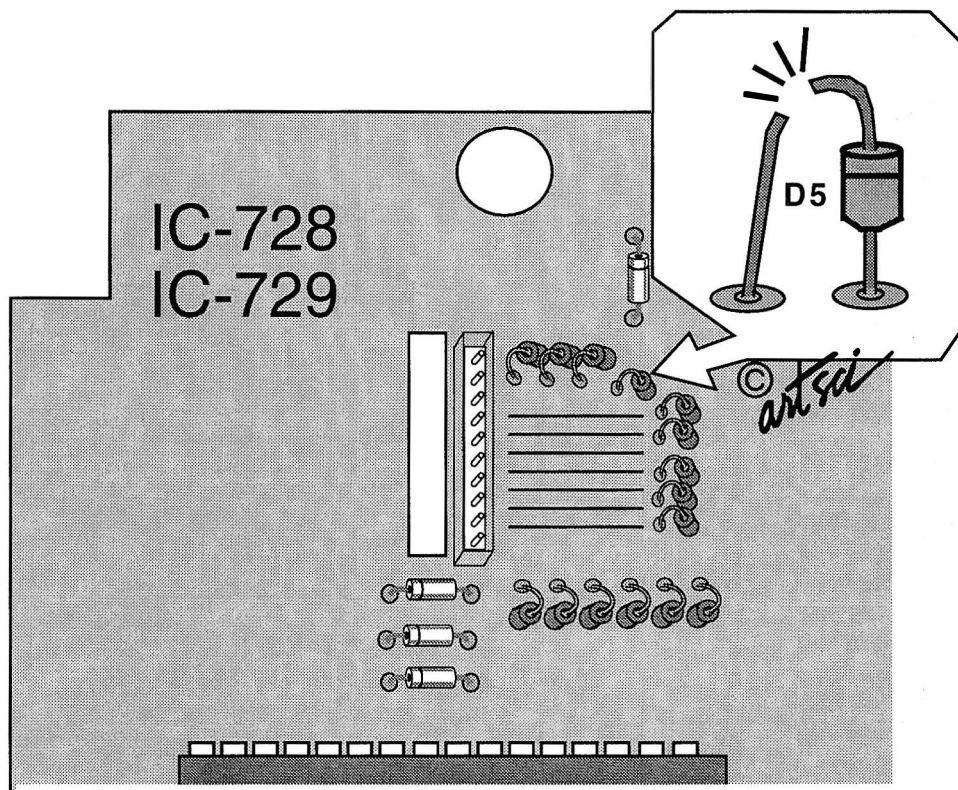
ICOM

Receive and Transmit Expansion

IC-728
IC-729

Expansion Range

.5 MHz - 30 MHz.
No 50 MHz expansion available.



Expanded RF Modification

1. Remove power and antenna.
2. Remove screws open case.
3. Locate PLL board.
4. Locate and **cut diode D5**
5. Reassemble the radio.
6. Reset the microprocessor
(Press & Hold [F] & [MW] and turn power on)

Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

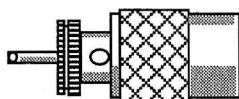
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

Expansion Range

3.400 - 4.099 MHz
6.900 - 7.599 MHz
9.000 - 10.599 MHz
13.900 - 14.599 MHz
17.900 - 18.599 MHz
20.900 - 21.599 MHz
24.400 - 25.099 MHz
27.900 - 28.599 MHz
29.400 - 30.099 MHz

Expanded RF Modification

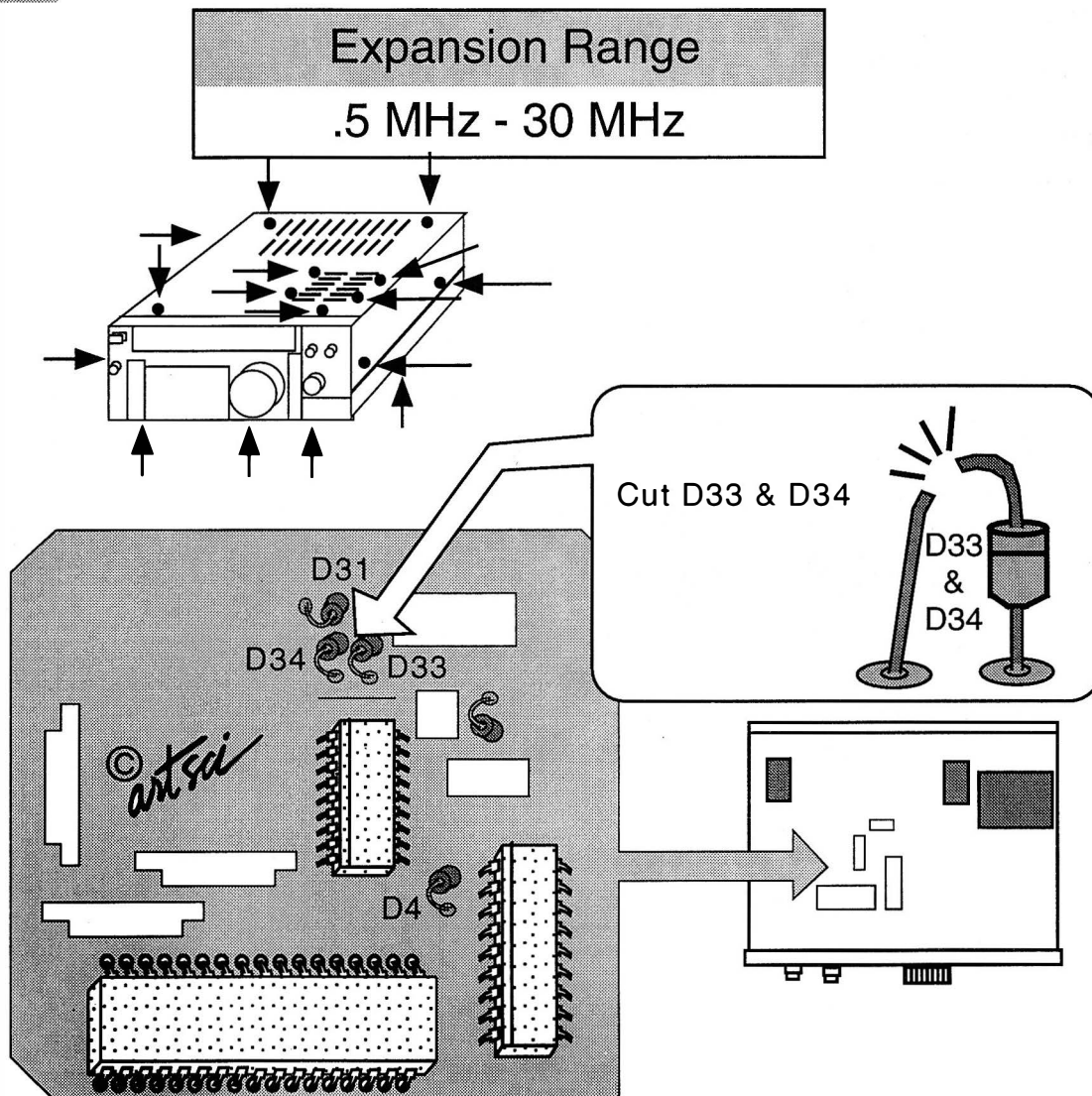
1. Remove power and antenna.
2. Remove screws open case.
3. Locate RF board.
4. **Cut green wire** (labeled 'D').
5. **Cut resistor R-48.**
TX on 10, 18 & 24 MHz
6. Reset the microprocessor. (See owners manual)
7. Reassemble the radio



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations
caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© *artsci*



Expanded RF Modification

Note: Accessing the main Board may require taking out many of the other components of the radio.

1. Remove power and antenna.
2. Remove screws and open top cover.
3. Remove screws and set PA unit aside.
4. Locate diodes D33 and D34 on the top of the PLL circuit board. (May be located under the heat sink)
5. Cut the Teflon covered leads of Diodes D33 and D34.
6. Reassemble the radio.

Radio/Tech Modifications Volume A

© artsci

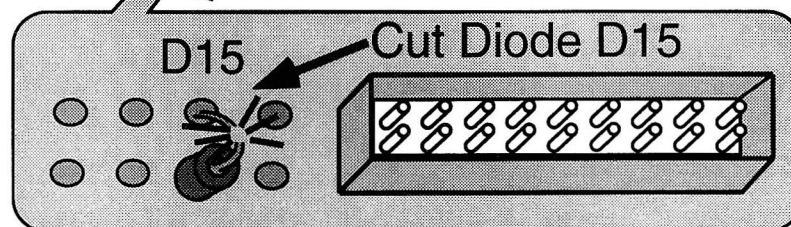
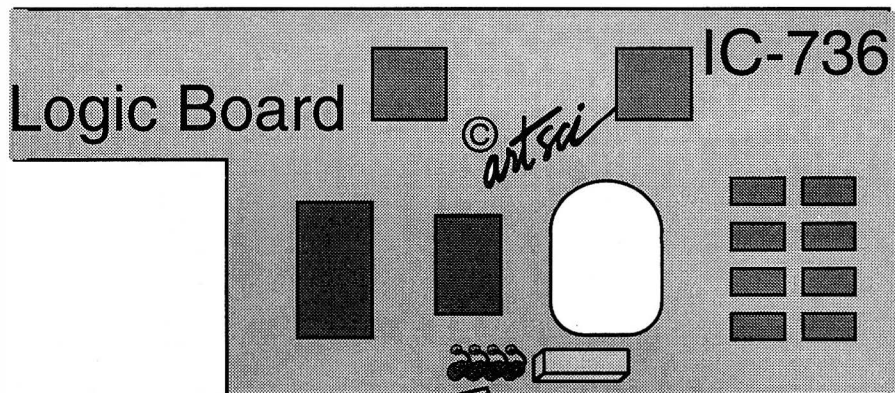
Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

Receive and Transmit Expansion

ICOM
IC-736

Expansion Range

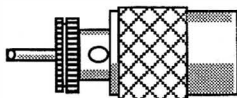
1.6 MHz - 33.0 MHz
45 MHz - 60 MHz



Some additional diodes may or may not be present

Expanded RF Modification

1. Remove power and antenna.
2. Remove screws and remove covers.
3. Locate Logic board (front of radio).
4. Locate and **cut Diode D15** (near connector, see drawing)
Diode D14 is the expanded RX diode make sure it is removed.
5. Reassemble the radio.
6. Reset the microprocessor if required (see owners manual)



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

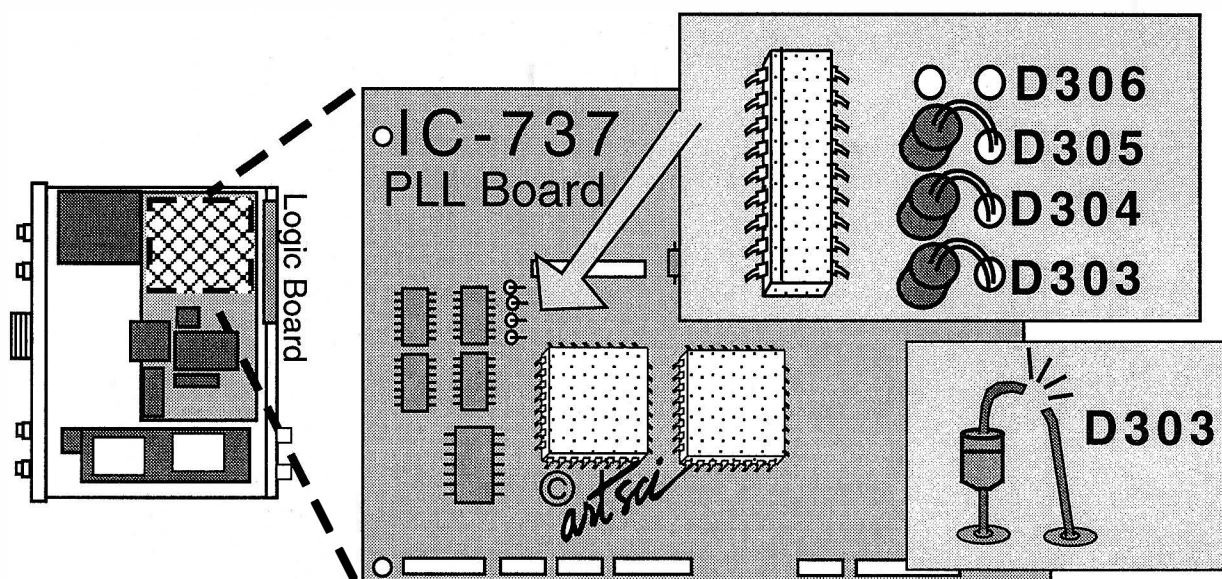
© artsci

ICOM - 37

Expansion Range

.5 MHz - 30 MHz

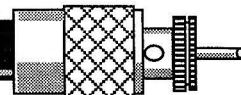
Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Note: Accessing the PLL Board may require taking out many of the other components of the radio.

Expanded RF Modification

1. Remove power and antenna.
2. Remove screws and open top cover.
3. Remove screws and open bottom cover.
4. Remove screws and remove PA unit.
5. Remove screws and fold out front display.
6. Locate PLL Unit on back of radio.
7. Locate diodes D3 on the PLL circuit board.
8. **Cut Diode D3.**
9. Reassemble the radio.

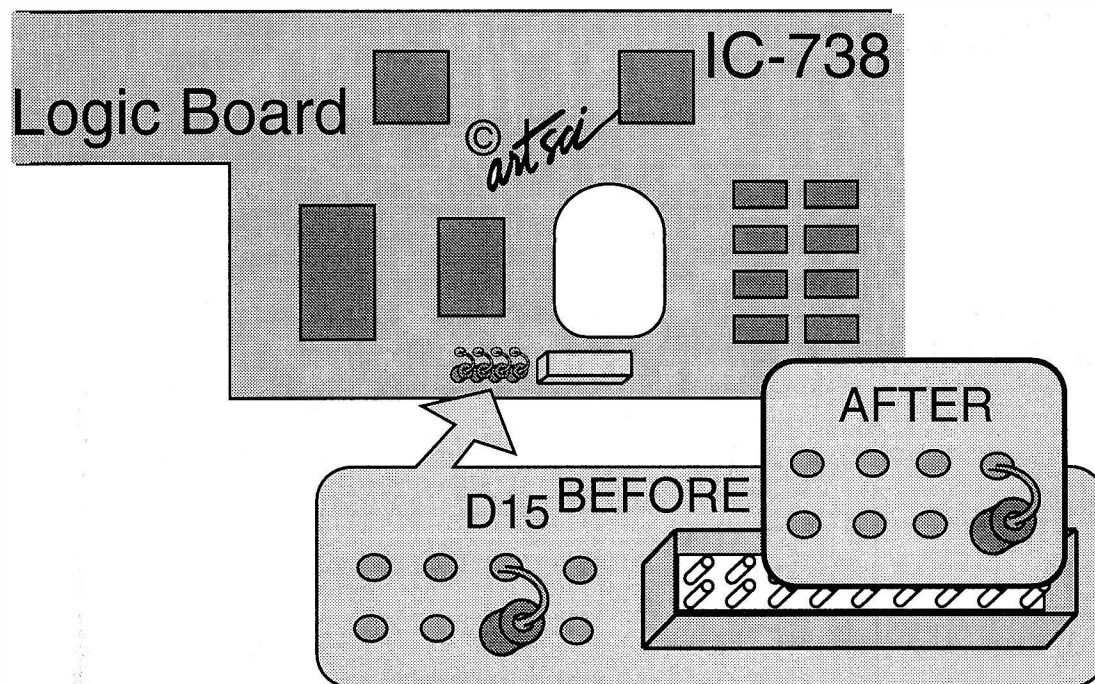


Receive and Transmit Expansion

ICOM
IC-738

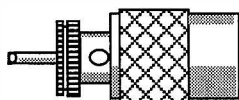
Expansion Range

.5 MHz - 30 MHz



Expanded RF Modification

1. Remove power and antenna.
2. Remove screws and remove top and bottom covers.
3. Swing PA Block aside and fold down the front panel.
(You may need to unplug the Q1 Cable, Note connector orientation)
4. **Locate Diode D15 and remove it.**
5. **Place the diode in the position right of D15** (see drawing)
6. Reassemble the radio.
7. Reset the microprocessor if required (see owners manual)



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

ICOM - 39

Expanded RF Modification

1. Remove power and antenna.
2. Remove screws open case.
3. Locate RF board.
4. **Cut (white resistor) jumper** located between D31 and 'C' wire.
5. Reset the microprocessor.
6. Reassemble the radio.

IC-745

Expanded RF Modification

1. Remove Power and Antenna.
2. Remove screws open case.
3. Locate RF board on the side of the radio.
4. **Cut the light brown wire on J7 Pin 1.**
5. Reassemble the radio.

IC-751

Expanded RF Modification

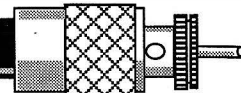
OLDER VERSION

1. Remove Power and Antenna.
2. Remove screws open case.
3. Locate RF board on the side of the radio.
4. **Cut the black wire on J2 Pin 1.**
5. Reassemble the radio.

Expanded RF Modification

NEW VERSION IC-751A

1. Remove Power and Antenna.
2. Remove screws open case.
3. Locate noise blanker board. (Near upper left hand of the front panel)
4. Locate and **cut resistor R34.** (far left end of the noise blanker board)
5. Reassemble the radio.

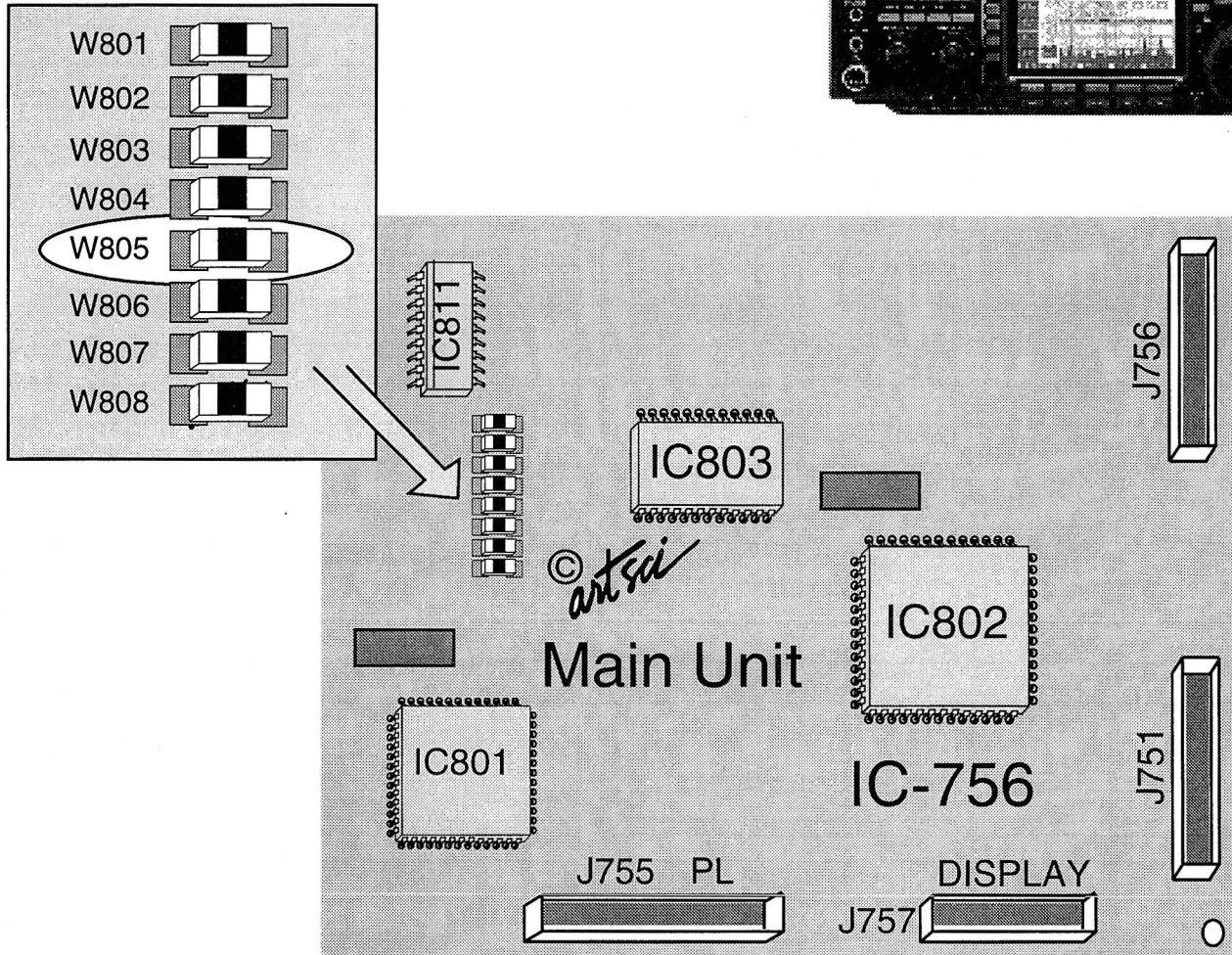
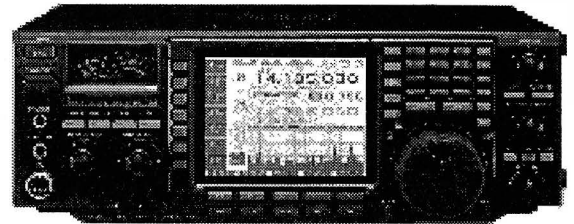


Receive and Transmit Expansion

ICOM
IC-756

Expansion Range

General Coverage Transmit
.5 - 30 MHz

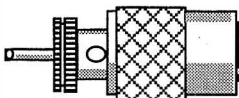


CAUTION:

This modification requires soldering or desoldering CMOS components. It requires special CMOS rated equipment and familiarity with surface mount soldering techniques.

Expanded RF Modification

1. Remove power and antenna.
2. Remove screws and open the case.
3. Locate the Main board.
4. **Locate and remove Chip jumper W805.**
5. Reassemble the radio.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

ICOM - 41

Radio/Tech Modifications

Frequency report

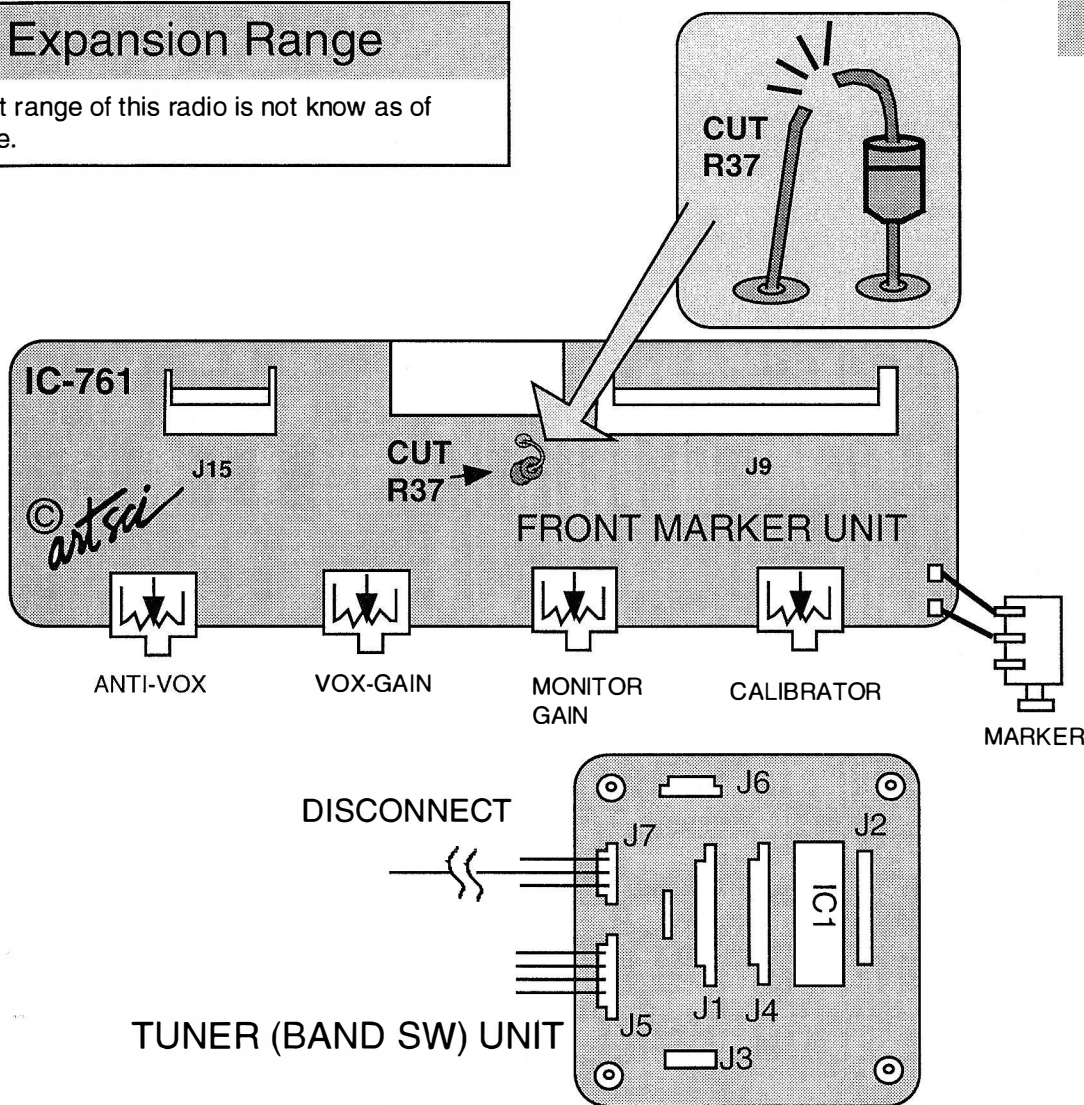
[illegible]

Receive and Transmit Expansion

ICOM
IC-761

Expansion Range

The Exact range of this radio is not know as of press time.



Expanded RF Modification

1. Remove power and antenna.
2. Remove screws open case (top and bottom covers).
3. Locate front (Marker) Unit. (Behind the monitor gain controls)
4. Locate and **cut Resistor R37**.
5. Position radio normal side up and locate the Tuner band switch unit. (Located on top of the tuner unit and behind the keyer unit)
6. **Disconnect the mute line** (Middle wire) from the connector J407. (J407 is plugged into connector J7 on the Tuner band unit)
7. Reassemble the radio.
8. **Reset the microprocessor.** (Hold [M-CLEAR] and turn power on)

Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

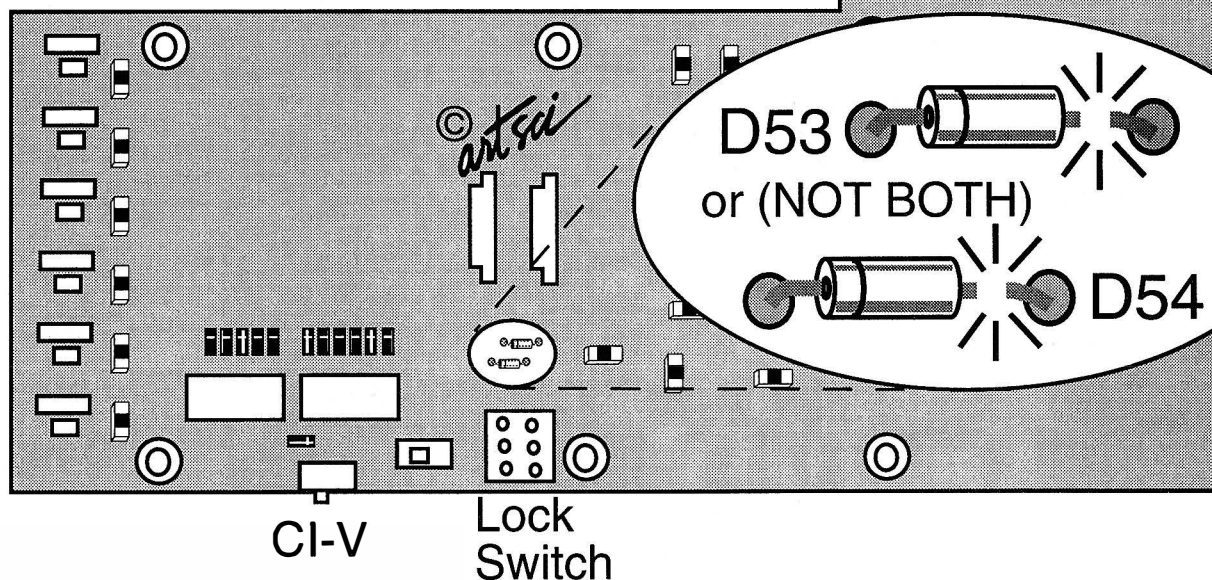
© artsci

ICOM - 43

Expansion Range

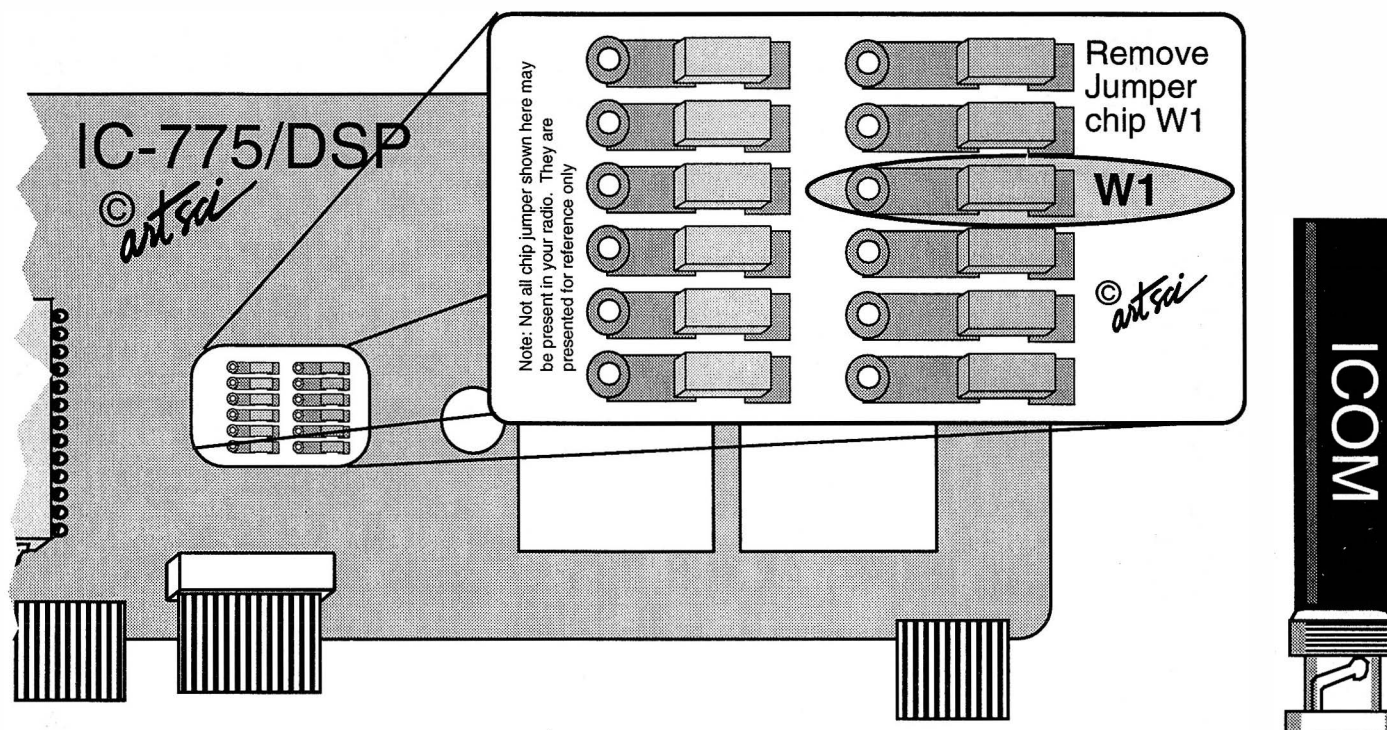
The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz. Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

Matrix Unit



Expanded RF Modification

1. Remove power and antenna.
2. Remove screws and open bottom cover.
3. Locate and **Cut diode D53 or D54**. (Try one then the other)
Note: (It is located on the "L" shaped board mounted vertically).
(Positioned just above the "LOCK" switch)
4. Reassemble the radio.
5. **Reset the microprocessor**. (Hold [M-CLEAR] and turn power on)

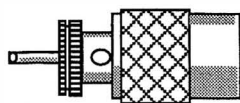


Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from .5Mhz - 30 Mhz.

Expanded RF Modification

1. Remove Power and antenna.
2. Remove screws and open radio.
3. Locate Logic board (Board B42918)
4. **Remove Jumper chip W1.**
5. Reassemble the radio.
6. Reset the microprocessor if needed. (press [CLEAR] & turn power on)



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

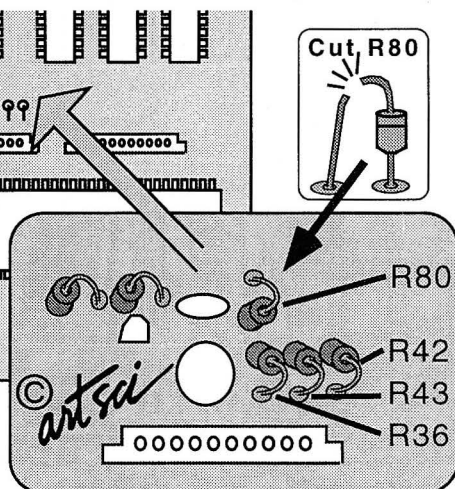
© artsci



Expansion Range

The Exact range of this radio is not know as of press time.

Logic B Unit

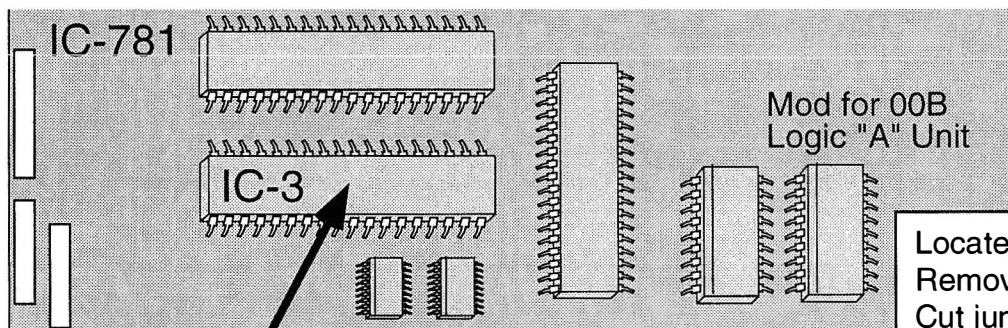


Expanded RF Modification

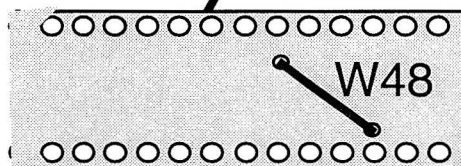
1. Remove power and antenna.
2. Remove screws open case.
3. Locate and **cut resistor R80** on Logic B unit.
4. Reset the microprocessor.
(may not be required)
5. Reassemble the radio
6. **Reset the microprocessor.**
(Hold [M-CLEAR] and turn power on)

One report sez there is no CB Transmit

The Mod Below is for Version 00B radios.



Locate Logic "A" board
Remove IC-3
Cut jumper W48 located under IC-3



Under this IC is Jumper W48
Remove Jumper W48

Radio/Tech Modifications Volume A



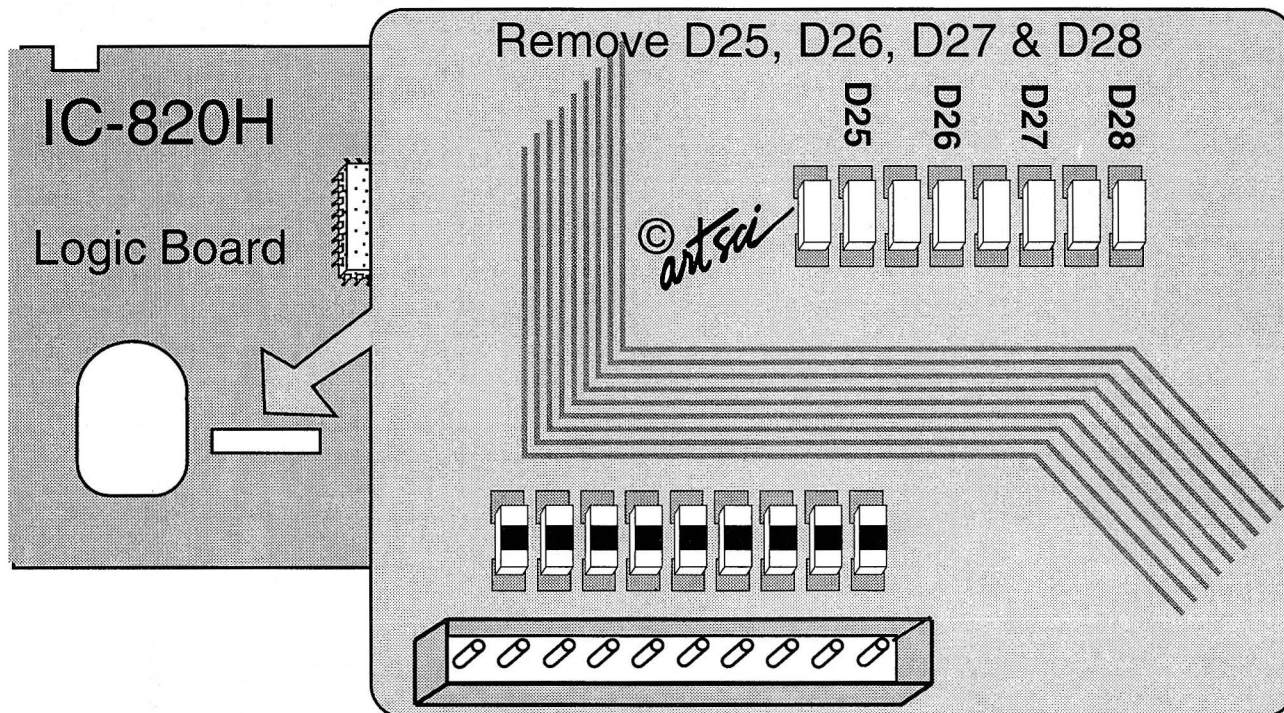
Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations
caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

Receive and Transmit Expansion Cross Band Repeater

ICOM
IC-820H

Expansion Range

136 - 174 MHz & 420 - 460 MHz



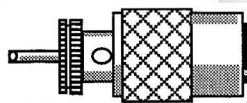
Expanded RF Modification

1. Remove power and antenna.
2. Remove screws and remove covers.
3. Locate Logic board (front of radio).
4. Locate and **cut Diode D25, D26, D27 & D28** (see drawing)
Diode D25 & D27 is VHF Diodes, D26 & D28 are the UHF Diodes .
5. **Install a diode** in the empty position between D27 & D28. (X-Band Repeater)
5. Reassemble the radio.
6. Reset the microprocessor if required (see owners manual)

Cross band Instructions

ON: Press [LOCK] switch on, Turn Power off, Press [M/S] & turn on.

OFF: Press [LOCK] switch off.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations
caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

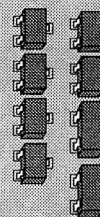
© artsci

ICOM - 47

IC-821H

Display Board

© artsci



Expanded RF Modification

1. Remove power and antenna.
2. Remove screws open case.
3. Locate display board
4. Locate and **cut resistor D101 (144 RX Mod)**
5. Locate and **cut resistor D103 (440 RX Mod)**
6. Locate and **cut resistor D105 (144 TX Mod)**
7. Locate and **cut resistor D107 (440 TX Mod)**
8. Locate and **install Diode P1F (1SS355 - X-Band repeater mod)**
9. Reset the microprocessor.
10. Reassemble the radio
11. **Reset the microprocessor.** (Hold [M-CLEAR] and turn power on)

Cross Band Repeater

TURN ON X-BAND

Turn power on
 Set frequency in both bands
 Set [LOCK] function (see user manual)
 Turn the radio off
 Press and hold [M/S] key and turn the radio on.
TURN OFF X-BAND - Press [LOCK]

Expansion Range

136 MHz - 174 MHz RX/TX
 420 MHz - 460 MHz RX/TX

Radio/Tech Modifications Volume A



© artsci

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

Receive and Transmit Expansion Cross Band Repeater

ICOM
IC-900

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz.

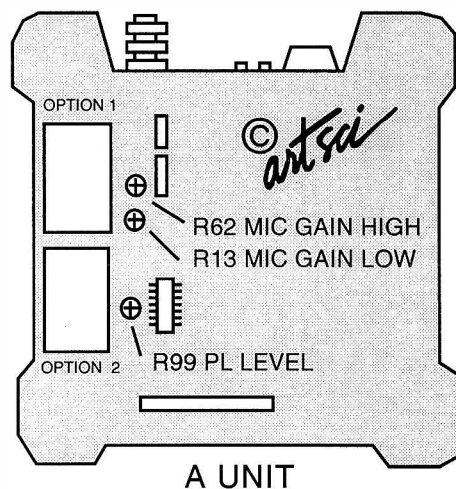
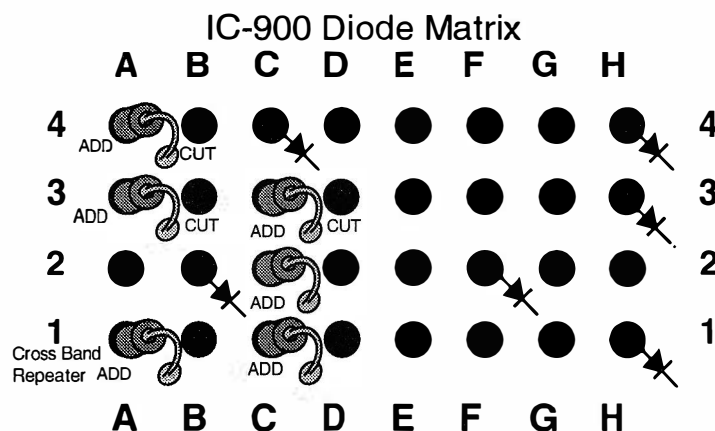
Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

Cross Band Repeater Instructions

(Simplex Freqs only)

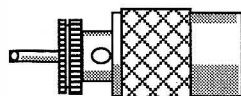
TURN ON - Turn LOCK switch ON.

TURN OFF - Turn LOCK switch OFF.



Expanded RF Modification

1. Open Control Head
2. Locate Diode Matrix on Display B board of Control Head.
3. **Add and remove Diodes** according to drawing
4. Reassemble control Head.
5. Open Interface A unit.
6. **Change the switch position from "1" (factory) to "2"** on interface A board (below the tone units).
7. Reassemble Interface A.
8. **Reset the microprocessor.**
(Press and hold [MR] and turn power off and back on)



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

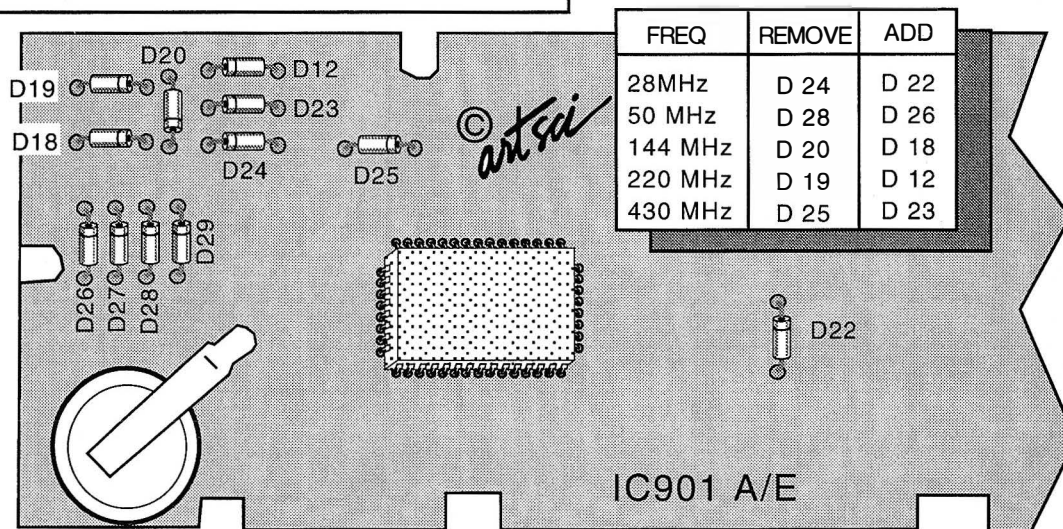
© artsci

ICOM - 49

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz.
Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

Mic Gain Adjustment: Adjust R70 in the Logic A Unit.



Expanded RF Modification

1. Remove control head Cable.
2. Remove screws and open "control head" case.
3. Locate and **remove diodes D24, D28, D20, D19 and D25.**
4. **Attach diodes D22, D26, D18 D12, D23. (1N914)**
5. **Remove Diode D27** (Cross band repeater mod).
6. Reassemble control head.
7. **Reset the microprocessor** (Turn radio on and press [CHECK] & [MW].

Cross Band Repeater

TO ACTIVATE

1. Turn the power off.
2. Push and hold [CHECK] and [LOCK] and turn power on.

TO DEACTIVATE

1. PRESS [LOCK] BUTTON.

Radio/Tech Modifications Volume A

© artsci

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

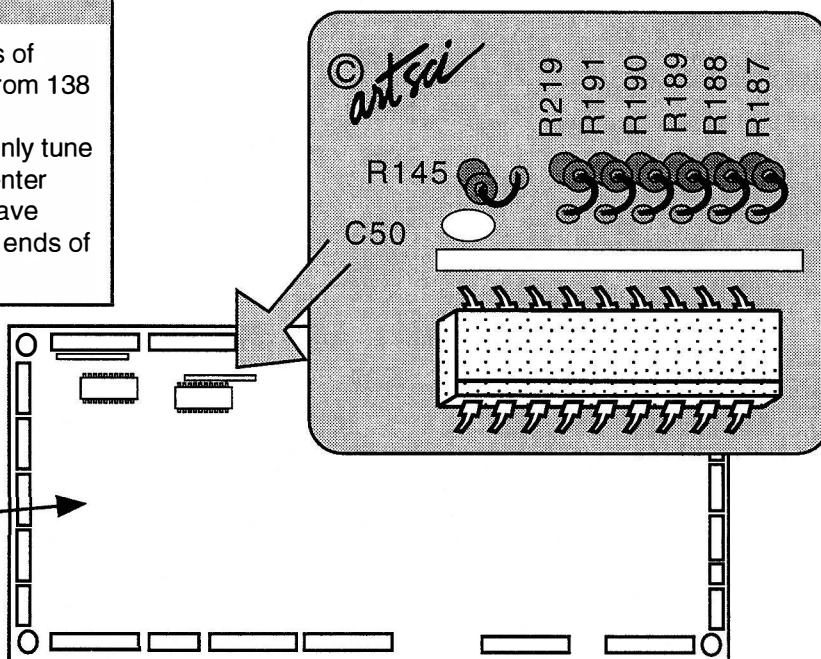
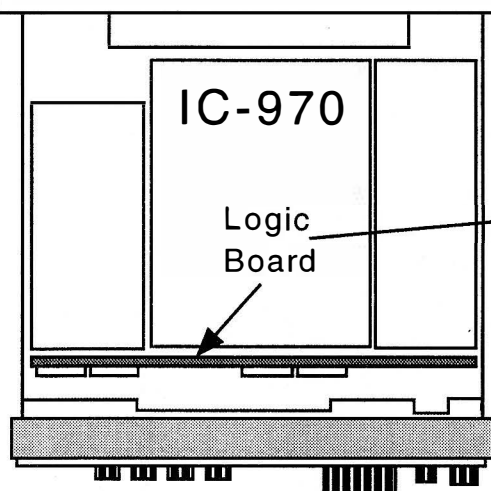
Receive and Transmit Expansion Cross Band Repeater

ICOM
IC-970

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Remove power and antenna.
2. Remove top and bottom covers.
3. Locate and expose the logic board. (see drawing)
4. Locate and **cut resistor R187.**
5. Locate and **cut resistor R190.**
6. Locate and **cut resistor R219.**
7. Locate and **cut resistor R191.** (XBand Repeater Mod)
8. Locate resistor position R 188 and add a **10K ohm resistor.**
9. Reassemble the radio.
10. **Reset the microprocessor.**
(Push and hold [MW] and turn power on).

Cross Band Repeater Instructions

- Turn ON -**
- 1) Set the MAIN & SUB Frequencies.
 - 2) Turn Radio off.
 - 3) Press [LOCK] switch ON.
 - 4) Press and hold [FUNCTION] & [M/S] switch and turn on.
- Turn OFF -** Turn the [LOCK] switch off.

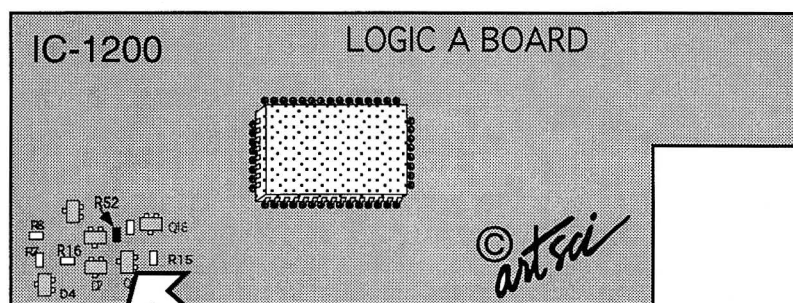
Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

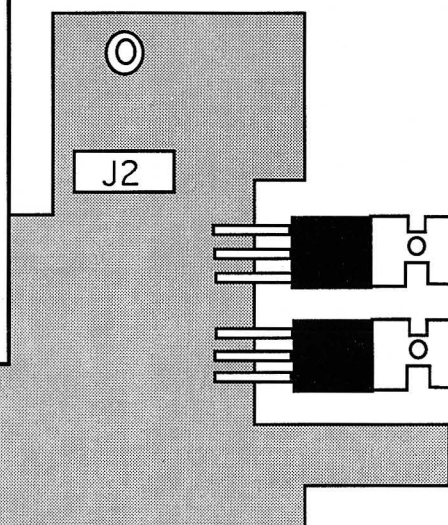
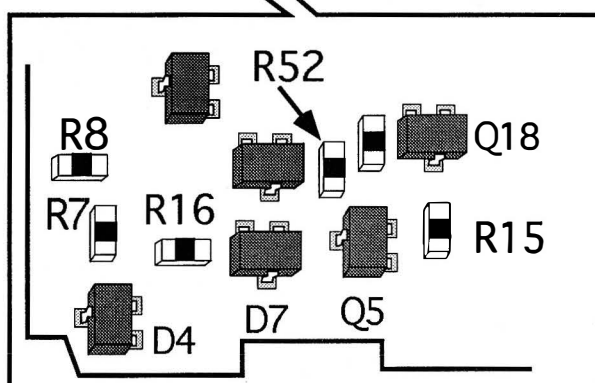
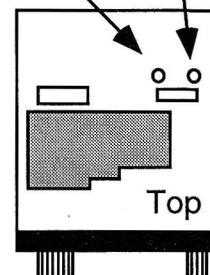
© artsci

ICOM - 51

Expansion Range
870 MHz - 960 MHz



R8 - Low TX Pwr
Hi TX Pwr



Expanded RF Modification

1. Remove Power and Antenna.
2. Remove screws open case.
3. Locate and **cut Resistor R52** on Logic A unit.
4. **Install a new antenna connector** to position J2 on RF board.
Note: a different antenna is required for the 870-960 bands
5. Reassemble the radio.
6. **Reset the microprocessor.**
(Hold down the tuning control and turn the power on)
or
(Insert a toothpick in hole in the corner of the bottom cover.)

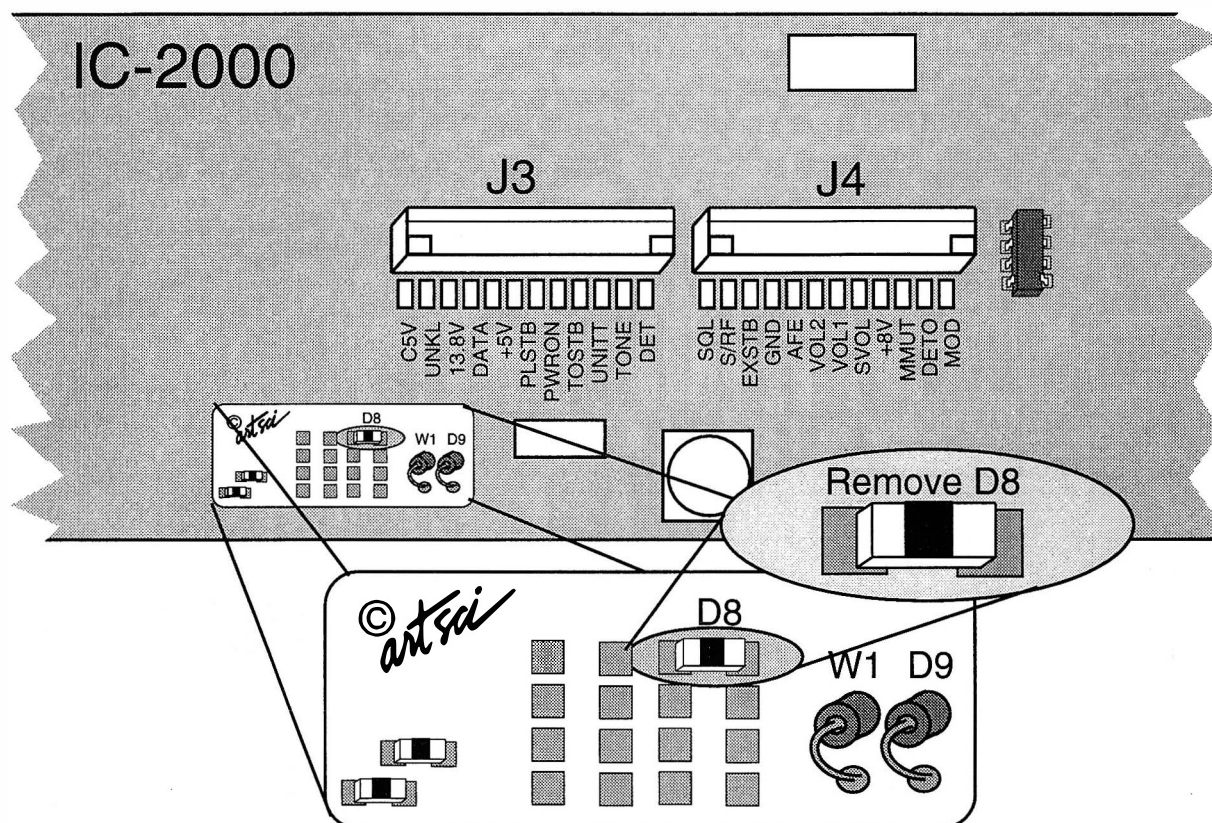
Radio/Tech Modifications Volume B

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com



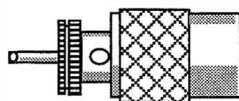
Expansion Range

118 Mhz - 174 MHz RX
138 MHz - 174 MHz TX

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

Expanded RF Modification

1. Remove power and antenna.
2. Remove Screws and open the radio.
3. Locate Control Board. (front Panel)
4. Locate and **cut Diode D8**
5. Reassemble the radio.
6. Reset the microprocessor.
(ALL RESET, see user manual)



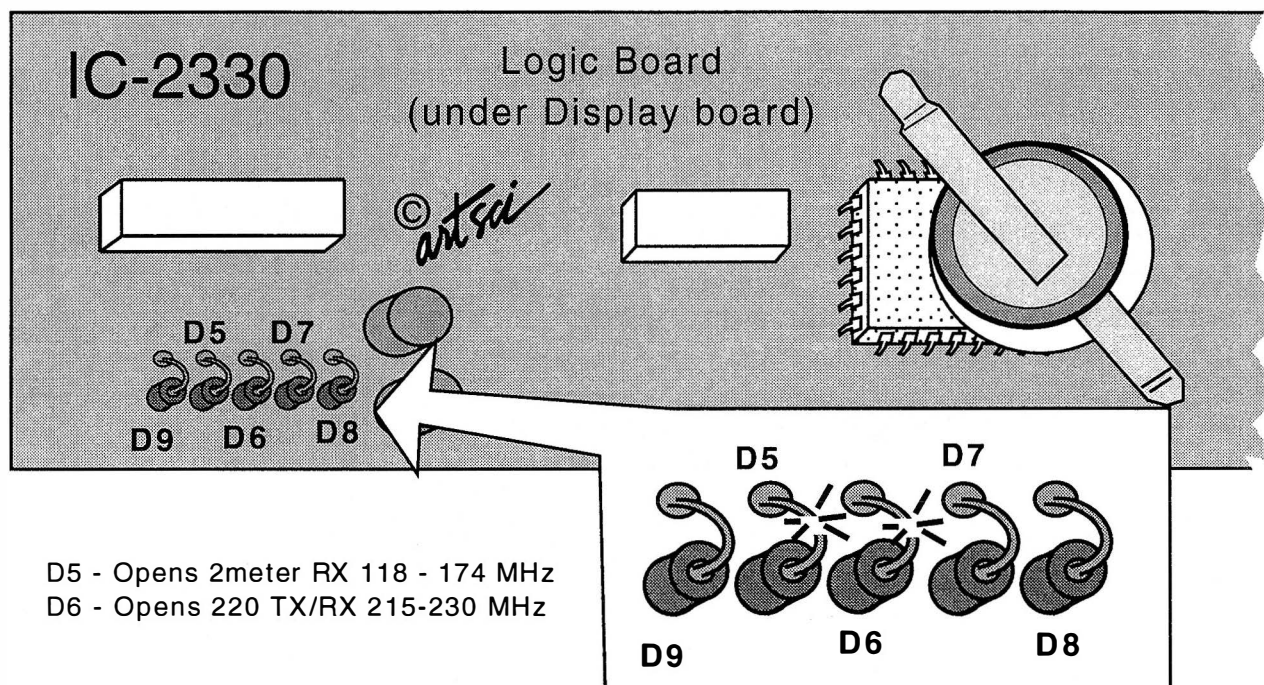
Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

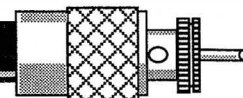
Expansion Range

RX: 118 MHz - 174 MHz
TX/RX: 215 MHz - 230 MHz



Expanded RF Modification

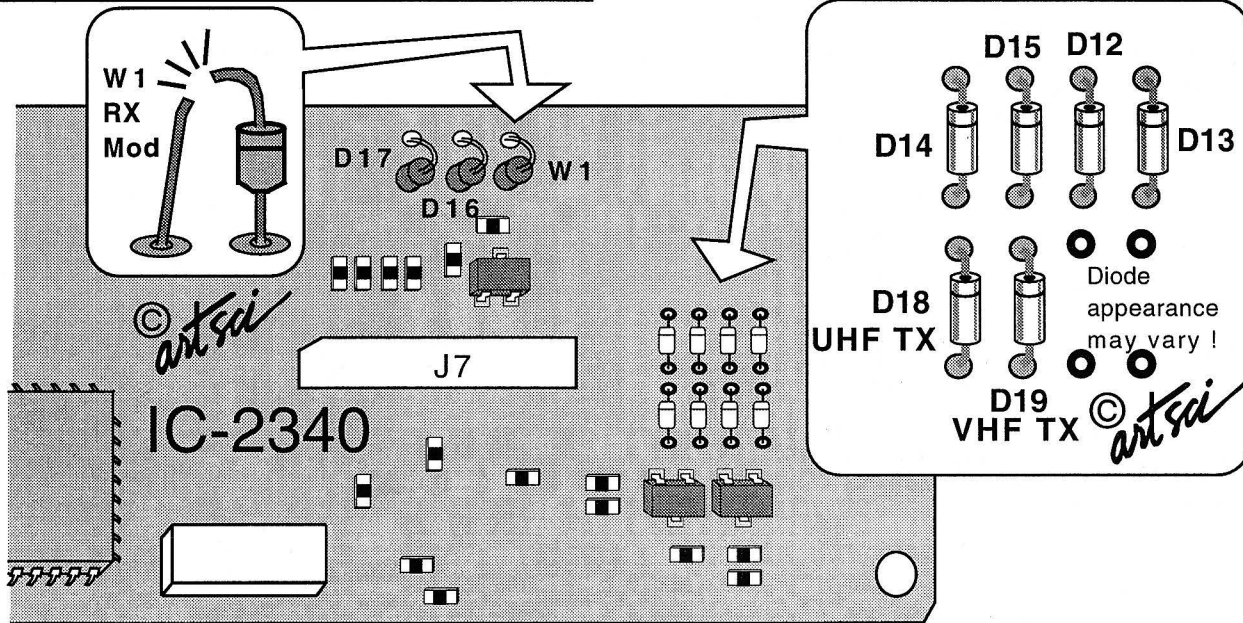
1. Remove Power and Antenna.
2. Remove screws open case.
3. Locate Logic Board. (on the front of the radio under display)
4. Locate and **cut Diodes D5 & D6**.
5. Reassemble the radio.
6. Reset the Microprocessor if needed.



Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz.
Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

STBSP	DATA	LCDATA	LCCLK	LCE2	/LINH	GND	POWER	LOW	UCK	UPU	LEY13	UVOL2	UVOL1	AFE
J7														
L5V	VOICE	CK	13.9V	DIM	LCE1	BUSY	UNITS	KEYS1	KEY11	KEY10	KEYS2	KEY12	USQL	KEYSO



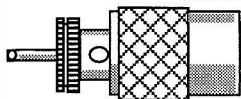
Expanded RF Modification

1. Remove Power and Antenna.
2. Remove screws open case.
3. Locate Logic Board.
4. Locate and **cut W1** (Extended Receive)
5. Locate and **remove diode D19** (Extended TX on VHF)
6. Locate and **remove diode D18** (Extended TX on UHF)
7. Locate and **remove diode D16** (X-Band Repeater)
8. Reassemble radio.

Cross Band Repeater

TURN ON - Set desired frequencies on each band
Press [VHF Main] & [UHF Main] & [SET] at the same time.
(memory indicator will change to "L")

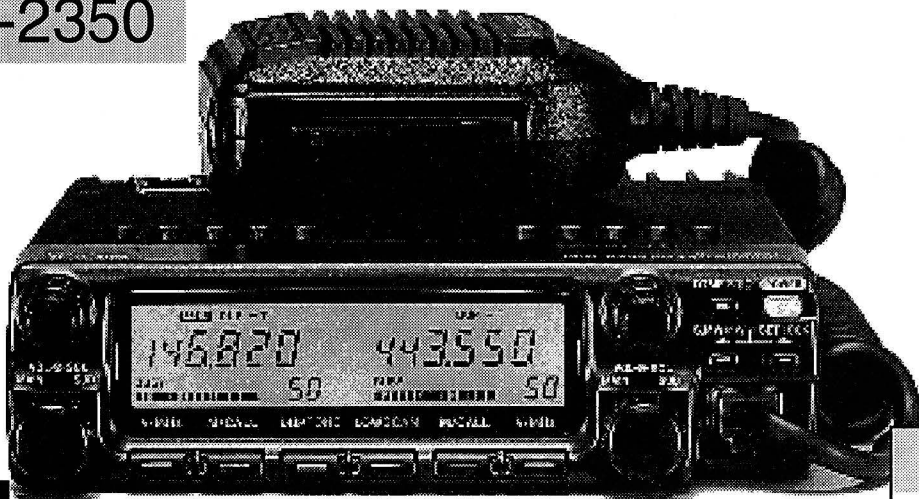
TURN OFF - Press [SET] for 1 second.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci



Expanded Range

Receive Range

118.000 - 135.999 MHz (am/fm)
126.000 - 174.000 MHz
320.000 - 399.995 MHz (am/fm)
400.000 - 479.000 MHz
830.000 - 950.000 MHz

Transmit Range

136.000 - 174.000 MHz
400.000 - 479.000 MHz

CAUTION:

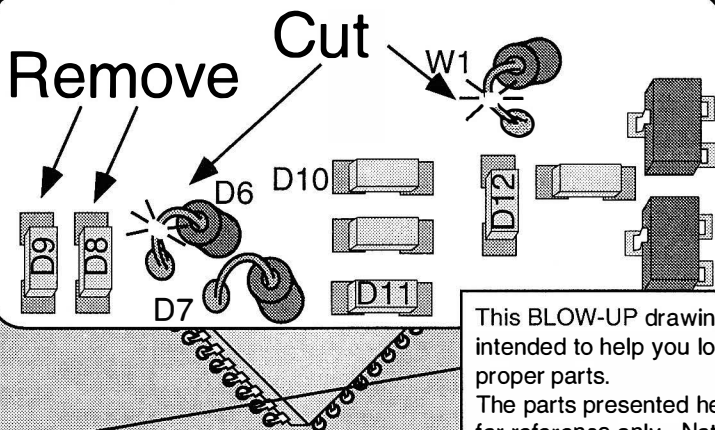
This modification requires soldering or desoldering CMOS components. It requires special CMOS rated equipment and familiarity with surface mount soldering techniques.

Diode Function

for use with radio outside the US

- D7 - Remove for RX expansion. "E version only"
- D8 - Remove for 440 Expansion
- D9 - Remove for 2 meter Expansion.
- D10 - Remove for 300/800 RX "E version only"
- D11 - Remove for Air Band. "E version only"
- D12 - Remove for 440 RX only Expansion

IC-2350H/A



Expanded RF Modification

1. Remove power and antenna.
2. Remove screws and open radio.
3. Locate Logic Board.
4. Locate and **cut Jumper w1**. (Expanded RX)
5. Locate and **remove diode D9**. (Expanded 2 meter)
6. Locate and **remove diode D8**. (expanded 440)
7. Locate and **cut Diode D6**. (Cross band repeater)
8. Reassemble the radio.

Keyboard Functions

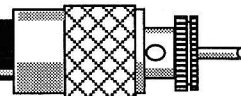
AM/FM Select

1. Press [V/MHz] more than one second.

Cross Band Repeater.

1. Set desired frequencies in both bands
 2. Press [VHF] & [UHF] main dial & [SET]
(a flashing 'L' will appear)
- Press [SET] for 1 second to exit repeater mode.

Radio/Tech Modifications Volume A



© artsci

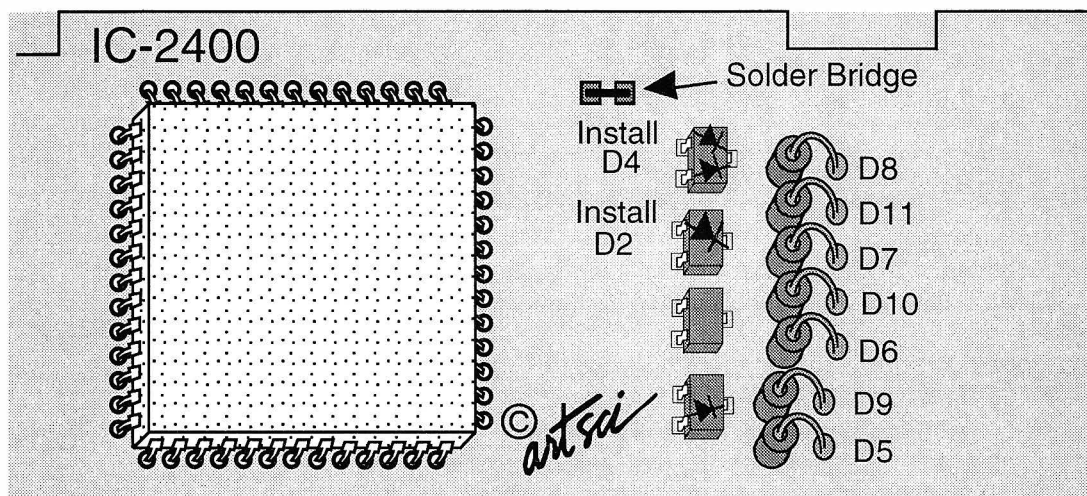
Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

Receive and Transmit Expansion Cross Band Repeater

ICOM
IC-2400

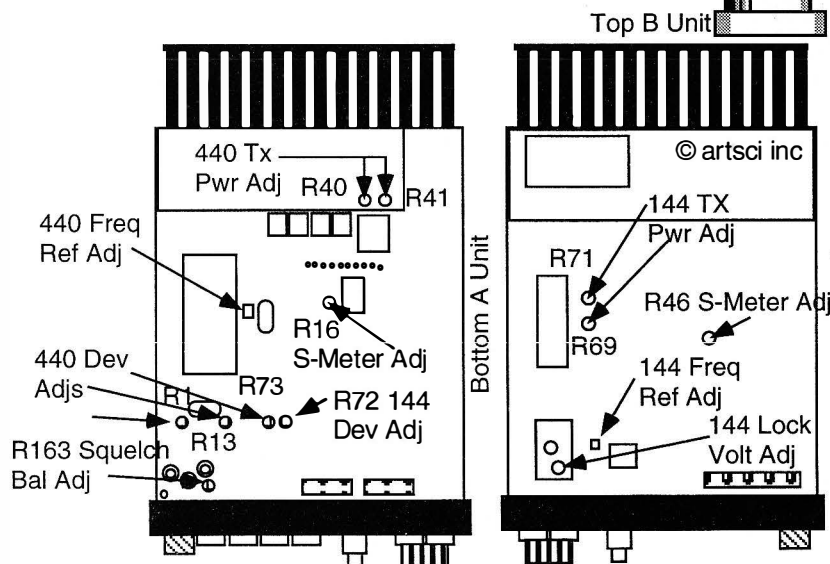
Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz.



Expanded RF Modification

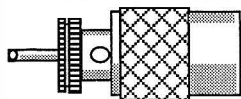
1. Remove battery and antenna.
2. Remove screws open case.
3. Locate and **cut diode D5.** (440 Mod)
4. Locate and **cut diode D6.** (440 Mod)
5. Locate and **cut diode D11.** (2 Meter mod)
6. Locate and **cut diode D8.** (2 Meter mod)
7. **Install chip diode. D4** (1SS184 B3)
8. **Install chip diode. D2** (1SS193 F3)
9. **Solder jump pads.**
10. Locate and **cut D9.** (Repeater Mod)
11. Reassemble the radio.
12. **Reset the microprocessor.**
(Press [SUB VOL] & [MW] and turn power on)



Cross Band Repeater Instructions

TURN ON - Push and hold [SET], [MONI] & [MHZ] & Mic down Button and turn power on.

TURN OFF - Push and hold [SET] then press [MHZ]

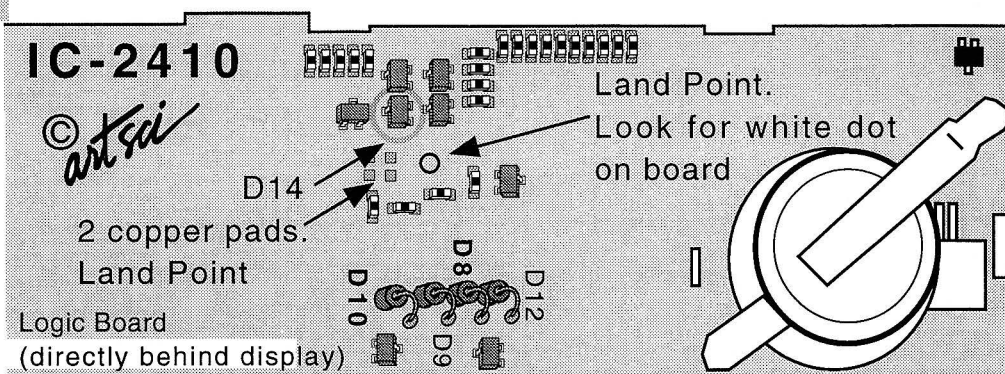


Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

ICOM - 57



Expanded RF Modification

1. Remove power and antenna.
2. Remove screws open top and bottom case. (two on each top and 4 on each side)
3. Remove the 4 screws in the metal frame holding the front panel and pull the front face away from the radio.
4. Locate and **cut diode D9** on logic board. (VHF Rx mod 118 - 136 MHz)
5. Locate and **cut diode D10**. (UHF R Mod 440 - 479 MHz)
6. Locate and **cut diode D8**. (320-399 MHz & 830-950 Rx Mod)
Note: An antenna cable is required for 830-950 MHz range. Use Jack J2 on main board B to connect an antenna cable.
7. Locate and **solder jump 'LAND' point** (two copper pads) on logic board. (VHF Tx mod)
8. Locate diode D14 on logic board.
9. **Replace D14** with a 1SS181 diode. (UHF Tx mod)
10. **Install a type "N" coax pigtail** (ICOM part OPC-166) to Connector J2 on 900 MHz IF strip. You will need a 5 3/4" gray coax jumper.
(Be sure to route the Pigtail through the antenna connectors in the rear panel).
14. Reassemble the radio.

Expansion Range

RX: 118 MHz - 136 MHz
320 MHz - 399 MHz
830 MHz - 950 MHz
TX: 138 MHz - 165 MHz
440 MHz - 479 MHz

Cross Band Repeater Instructions

- TURN ON -**
1. Set VHF & UHF Frequency. Offset and tone can be programmed in.
 2. Press and Hold [BAND] & [SET] switch.
The Memory number indicator will blink an "L" symbol.

NOTE: The microphone PTT will operational. Use the [UP] & [DOWN] keys to elect the transmitting band. A flashing decimal point will appear on the selected band.

- TURN OFF -**
1. Press and hold the [SET] button until the memory "number" display appears.

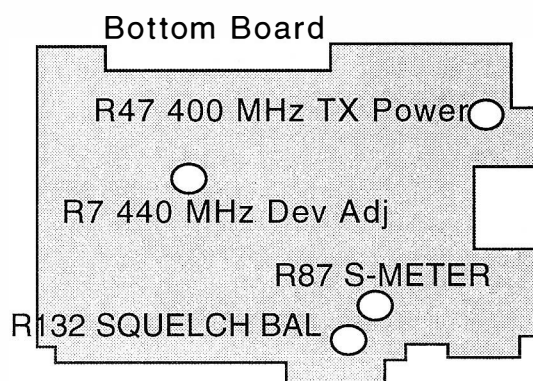
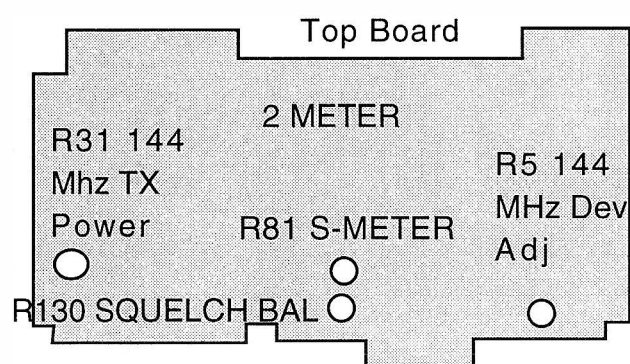
Radio/Tech Modifications Volume A

© artsci

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

Voice Answer Back Function (optional UT-66 & UT-55 required)

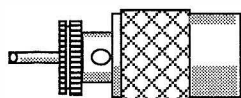
1. Switch on the SUB BAND remote mode. (see user manual)
2. Send remote control code "D" & "C" . (Control is on the sub band frequency)
The operating frequency of the main band will be announced.



Special Commands

ENTER REMOTE DTMF MODE	Send "B" PASSWORD "#" Default is B000#
EXIT DTMF REMOTE MODE	Send "B" PASSWORD "*" Default is B000*
XBAND REPEATER ON	Press [BAND] & [SET] until flashing "L" appears
XBAND REPEATER OFF	Press [SET] until memory # appears.
REMOTE XBAND ON	Send "D" "B" "*" on remote DTMF keypad.
REMOTE XBAND OFF	Send "B" "PASSWORD" "#" Default is B000#
REMOTE VOICE READBACK	Send "D" "C" on remote DTMF keypad.

XBAND function must be off to control all transceiver functions.



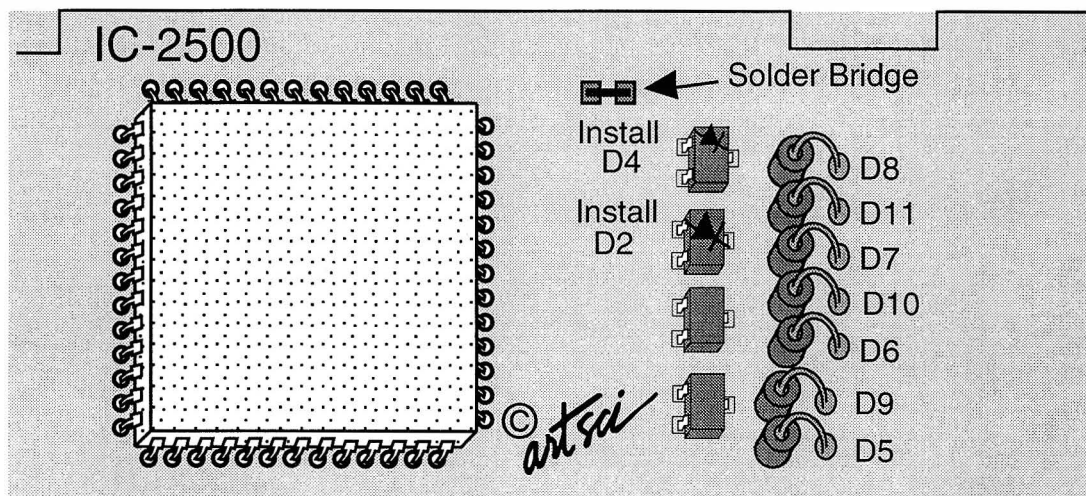
Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

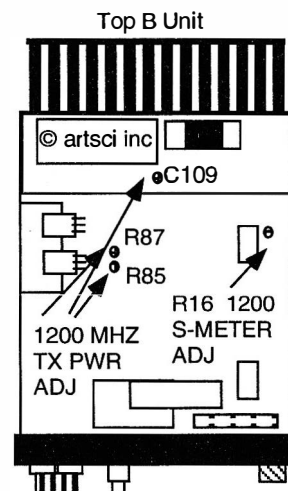
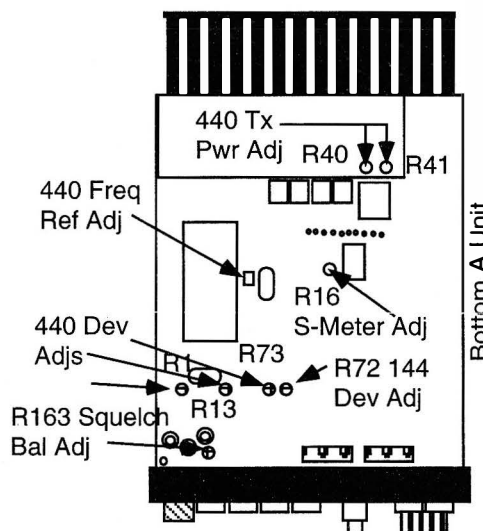
Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz.



Expanded RF Modification

1. Remove battery and antenna.
2. Remove screws open case.
3. Locate and **cut diode D11.** (440 Mod)
4. Locate and **cut diode D 6.**(440 Mod)
5. **Install Chip Diode D 4** (see drawing)
6. Locate and **cut diode D11**
7. Locate and **cut diode D8**
8. **Install chip diode. D 2** (see drawing)
9. **Solder jump pads.**
10. Locate and **cut D 9** (Repeater mod)
11. Reassemble the radio.
12. **Reset the microprocessor.**
(Press and hold [SUB VOL] & [MW] and turn power on)



Cross Band Repeater Instructions

TURN ON - Push and hold [SET], [MONI] & [MHZ] & Mic down Button and turn power on.

TURN OFF - Push and hold [SET] then press [MHZ]

Radio/Tech Modifications Volume A

© artsci

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

Receive and Transmit Expansion Cross Band Repeater

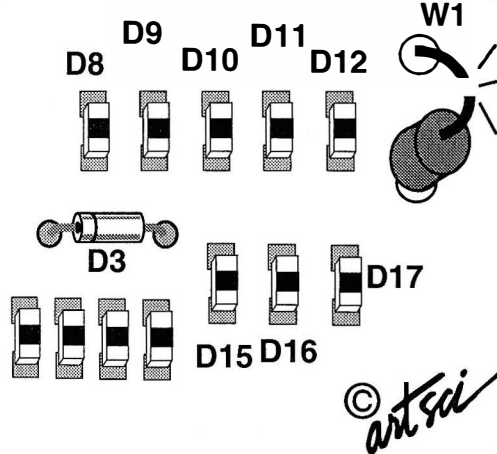
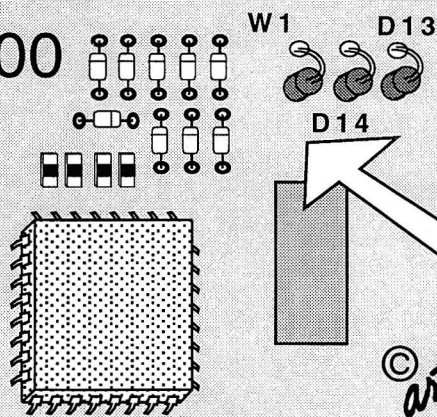
ICOM
IC-2700

Expansion Range

118 MHz - 173.995 MHz
320 MHz - 479 MHz

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

IC-2700



Expanded RF Modification

1. Remove power and antenna.
2. Remove control head.
3. Locate logic board, front of radio (under control head).
4. Locate and **cut Jumper W1** (RX only mod)
5. Locate and **remove Diode D16**. (UHF TX)
6. Locate and **remove Diode D17**. (VHF TX)
7. Locate and **remove Diode D14**. (X-Band Repeater)
Note: Diode D14 is not installed in USA versions.
8. Reassemble the radio.
9. You may be required to reset the Microprocessor. (see owners manual)

CAUTION:

This modification requires soldering or desoldering CMOS components. It requires special CMOS rated equipment and familiarity with surface mount soldering techniques.

Cross Band Repeater Instructions

On: with Hang time: Press [VHF] [UHF] KNOB & [SET/LOCK] for 1 Sec.
On: with no hang time: Press [VHF] [UHF] [SET/LOCK] & [DUP] for 1 Sec.
OFF: Press [SET]

Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

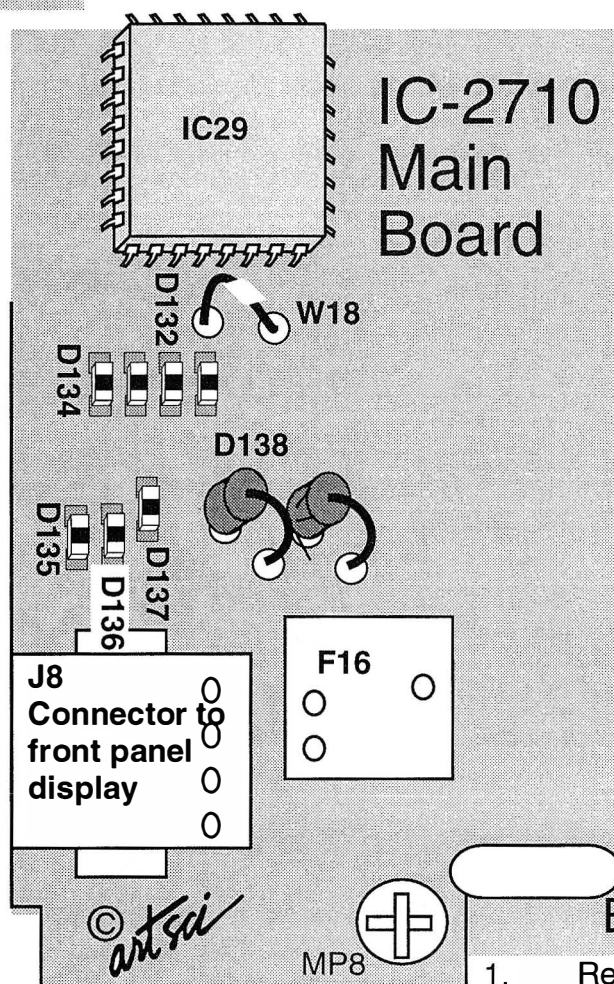
© artsci

ICOM - 61

ICOM

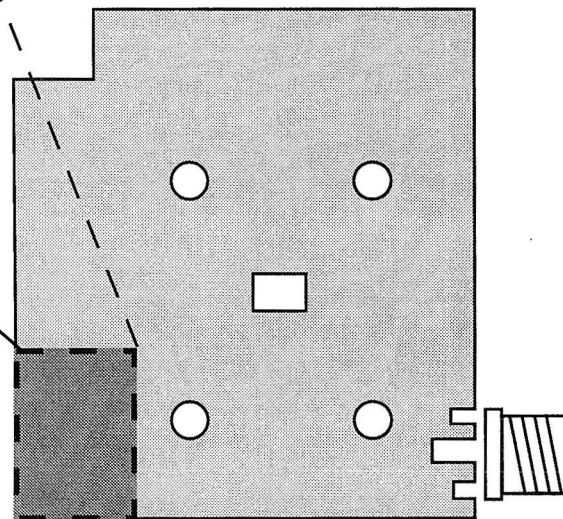
IC-2710

Receive and Transmit Expansion



Expansion Range

118 - 135.995MHz RX, 136 - 174 MHz TX&RX
320 - 399.995 MHz RX 400 - 479 MHz TX&RX
849- 869 MHz & 894 - 950 MHz RX
Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Remove Power and antenna.
2. Open the radio and locate the main board.
3. Locate and **cut jumper W-18** (all RX expansion)
(or remove D134 for 300 & 800 RX only)
(or remove D132 for UHF RX only)
4. Locate and **remove diode D135** (VHF TX)
5. Locate and **remove diode D136** (UHF TX)
6. Locate and remove diode D139 (X-Band)
7. Reassemble the radio.
8. Reset the MicroP
(Press & hold both [S.MW] & turn on.)

AM/FM Selection

Select AM or FM mode
Select AIR or 320 MHz band
Press [MONI] key for 1 second.
(an "<" or ">" will appear in AM mode)

Cross Band Repeater

Start Cross band mode.

Set desired frequency, tone and offset on both bands.
Press [VHF] and [UHF] main knobs and the [SET] key at the same time.
(an "L" will appear on the display)
(for zero hang time also press the [LOW] key with the above command)

Exit Cross band mode.

Press [SET] to exit cross band repeater mode.

If you have to know what they do :
D-134=Enable receive on 300 & 800 MHz
D-132=Enable receive on 300 MHz

Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

Performance Report

Radio _____

Date _____

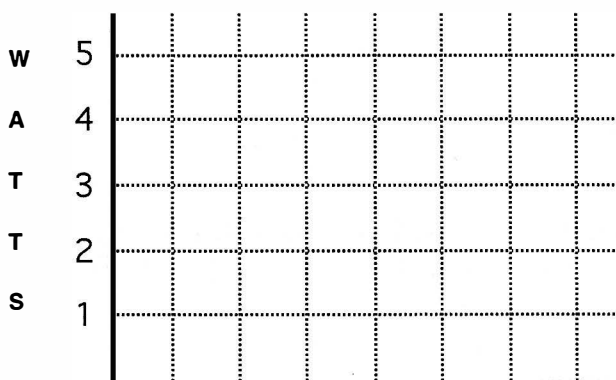
Owner : Name _____

Address _____

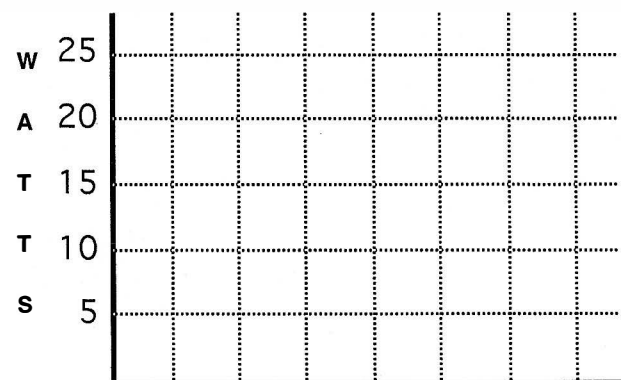
City _____ St. _____ Zip _____

Phone (_____) _____ - _____

Description	Before	After
Power out (Low)	_____ Watts	_____ Watts
Power out (High)	_____ Watts	_____ Watts
Frequency Error (Simplex)	_____ Hz	_____ Hz
Frequency Error (Offset)	_____ Hz	_____ Hz
Receive Sensitivity (Mid-band)	_____ uv	_____ uv
Receive Sensitivity (_____ MHz)	_____ uv	_____ uv
Receive Sensitivity (_____ MHz)	_____ uv	_____ uv
PL Deviation	_____ Hz	_____ Hz
DTMF Deviation	_____ KHz	_____ KHz
Audio Deviation	_____ KHz	_____ KHz
Lowest usable Freq @ .5 Pwr	_____ MHz	_____ MHz
Highest usable Freq @ .5 Pwr	_____ MHz	_____ MHz



Frequency

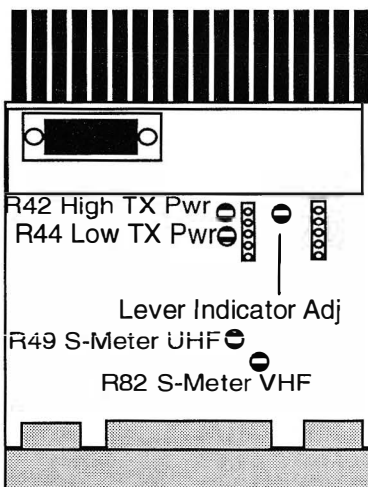
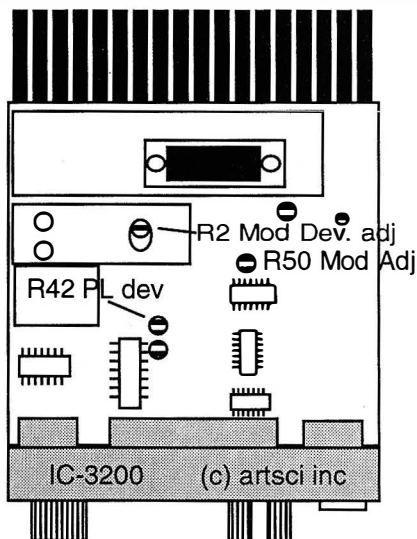
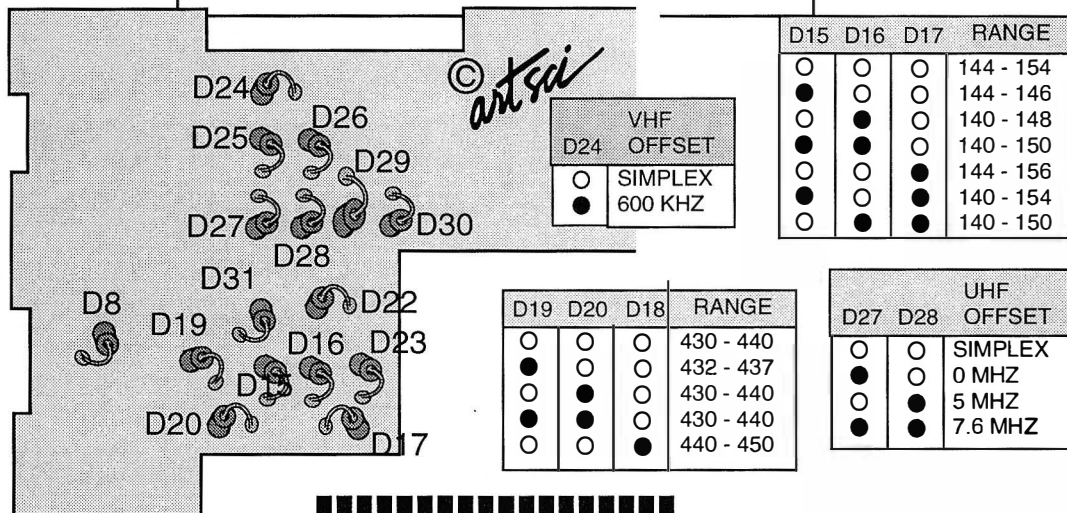


Frequency

Expansion Range

See Diode charts below.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

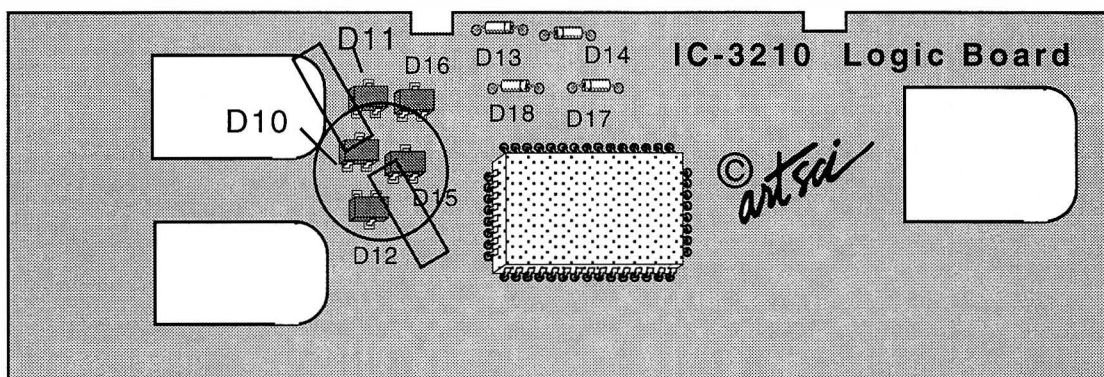


Expanded RF Modification

1. Remove battery and antenna.
2. Remove screws open case.
3. Locate Diode programming matrix (Control Head).
4. **Install or remove diodes** using tables below.
5. Reassemble the radio.
6. Reset the microprocessor.

Receive and Transmit Expansion Cross Band Repeater

ICOM
IC-3210



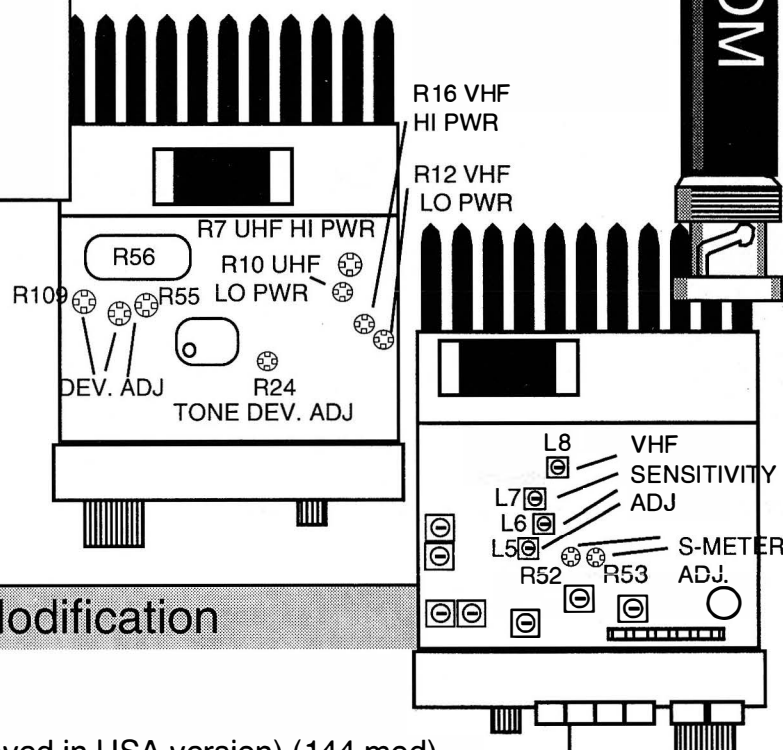
Cross Band Repeater Instructions

TURN ON - Set radio to "SPT mode".
Push and hold "Band switch &
"Lock switch"
("SPT" and "L" will flash)

TURN OFF - Press [LOCK] switch.

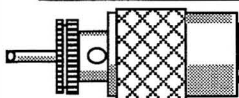
Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz.
Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Remove battery and antenna.
2. Remove screws open case.
3. Locate and **cut diode D17**. (Already removed in USA version) (144 mod)
4. **Replace chip diode D10** in position A. (New: 1SS184 B3) (144 mod)
5. Locate and **cut diode D18**. (440 mod)
6. **Replace chip diode D11** in position B (old: 1SS196 New: 1SS184 (B3))(440 mod)
7. Locate and **cut diode D14**. (Repeater mod)
8. Reassemble the radio
9. **Reset the microprocessor.**
(Push and hold [SQUELCH/Monitor] & [LOCK] and turn power on)



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

ICOM - 65

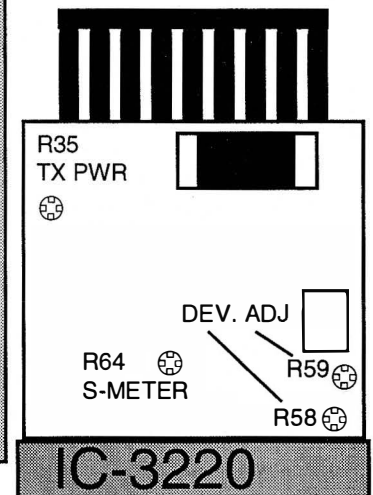
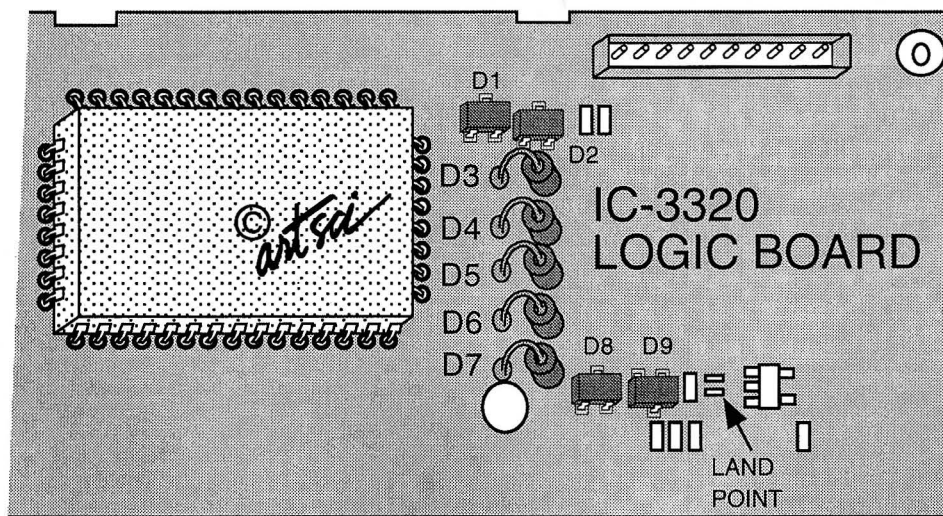
Expansion Range

118.000 - 135.995 MHz (AM) RX
 136.000 - 174.000 MHz (FM) RX
 136.000 - 174.000 MHz (FM) TX
 440.000 - 479.000 MHz (FM) RX & TX

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

Expanded RF Modification

1. Remove power and antenna.
2. Remove screws open case.
3. Locate and **Cut Diode D4** on the LOGIC board. (VHF AM)
4. Locate and **Cut Diode D5** on the LOGIC board. (UHF)
5. **Install a jumper at "land" point.** (VHF) Located right of D9.
6. **Install a diode (1SS181)** at Location D9 on the LOGIC board.
7. Reassemble the radio
8. Reset the microprocessor.
(Press and hold [SET] & [MW] and turn radio on)

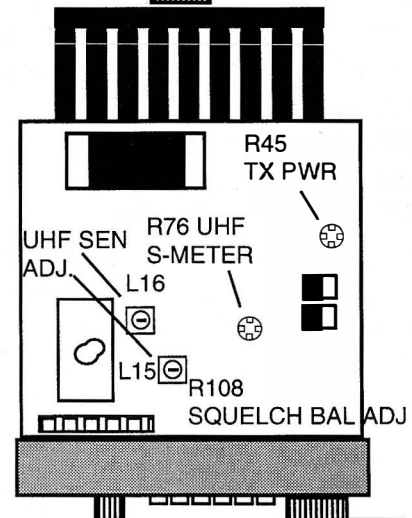


Cross Band Repeater Instructions

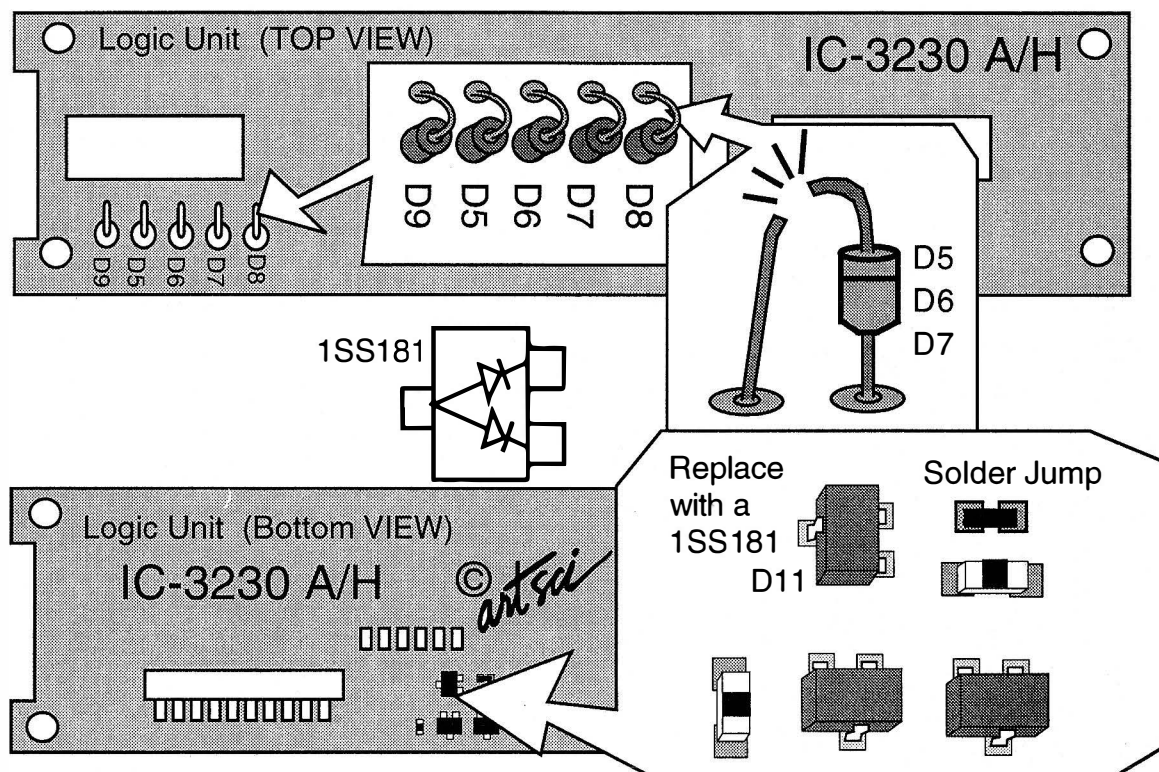
TURN ON - Set VHF & UHF Frequencies in DUAL WATCH mode.
 Press and hold [BAND] and press [SET].
 Memory channel will show a flashing "L"

TURN OFF - Press [SET] key.
 Turning off the radio will not disable repeater mode.

Note: The Mic PTT will still operate the radio in repeater mode!!!



Radio/Tech Modifications Volume A



Expanded RF Modification

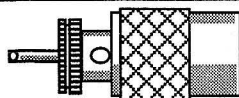
1. Remove power and antenna.
2. Remove 12 case screws
3. Remove 4 front cover screws
4. Remove 4 screws holding front frame to main frame.
5. Pull front frame out enough to access front frame.
6. Locate and **clip Diodes**:
D5 = 174-300 MHz RX,
D6 = 118-136 MHz RX,
D7 = 450-479 MHz RX
7. Unclip the two white ribbon cables attaching the logic board to the main frame.
8. **Solder jump foil pad** as shown. 118 - 174 TX mod.
9. **Replace D11 with a 1SS181** [A3]. 450-479 TX mod.
10. Reassemble the radio.

For 800MHz reception add an antenna cable to jack J1.
Run the cable out the back of the radio via the extra antenna coax plug.

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

Performance Report

Radio _____

Date _____

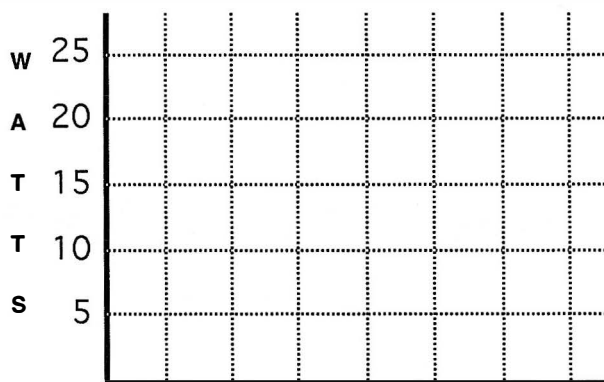
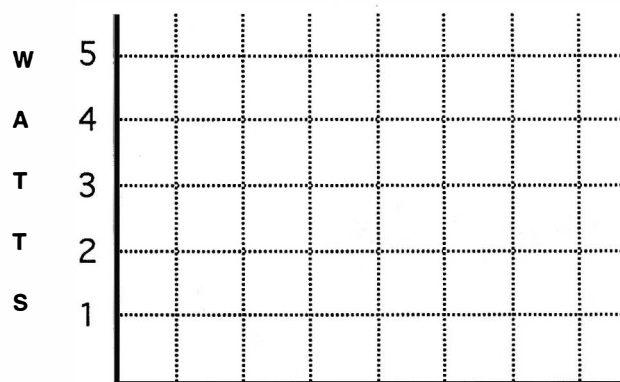
Owner : Name _____

Address _____

City _____ St. _____ Zip _____

Phone () - _____

Description	Before	After
Power out (Low)	_____ Watts	_____ Watts
Power out (High)	_____ Watts	_____ Watts
Frequency Error (Simplex)	_____ Hz	_____ Hz
Frequency Error (Offset)	_____ Hz	_____ Hz
Receive Sensitivity (Mid-band)	_____ uv	_____ uv
Receive Sensitivity (____MHz)	_____ uv	_____ uv
Receive Sensitivity (____MHz)	_____ uv	_____ uv
PL Deviation	_____ Hz	_____ Hz
DTMF Deviation	_____ KHz	_____ KHz
Audio Deviation	_____ KHz	_____ KHz
Lowest usable Freq @ .5 Pwr	_____ MHz	_____ MHz
Highest usable Freq @ .5 Pwr	_____ MHz	_____ MHz

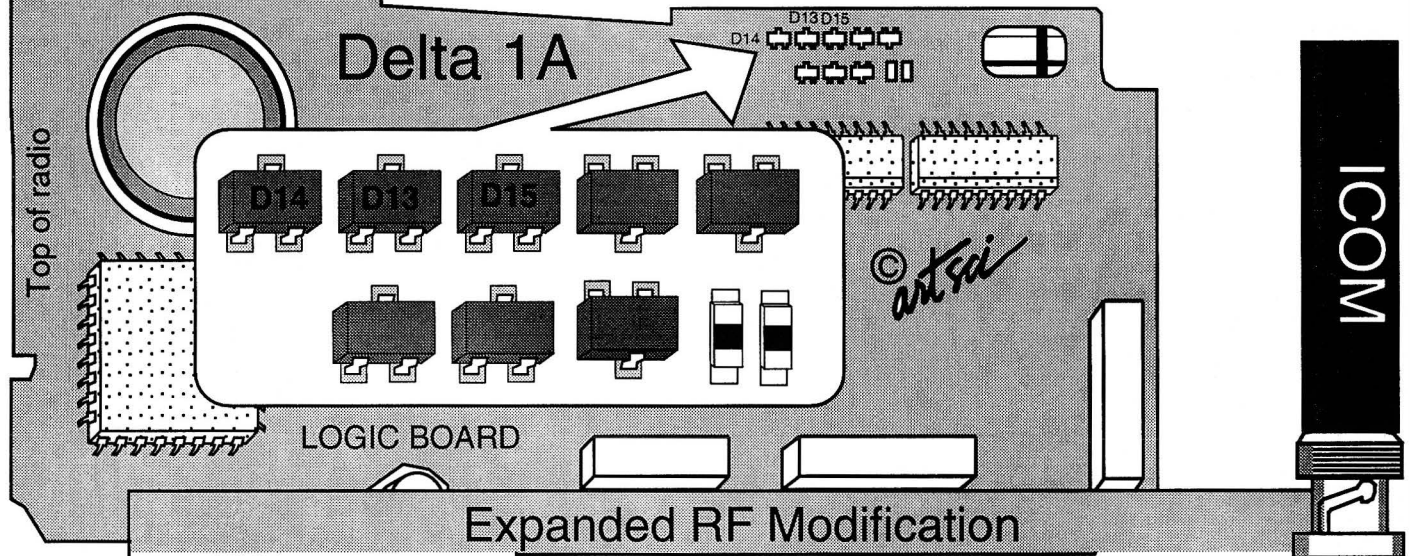


Expansion Range

118 - 136 MHz AM mode (RX only)
 136 - 174 MHz FM mode (TX & RX)
 350 - 470 MHz FM mode (TX & RX)
 800 - 950 MHz FM mode (RX only)
 1240 - 1300 MHz FM mode (TX & RX)

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

Note: Not all diodes may be installed in your radio.
 The above picture shows all diodes for reference only



Expanded RF Modification

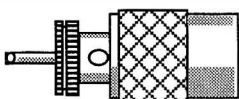
1. Remove battery and antenna.
2. Remove screws and open the radio.
3. Locate and remove Diode D14
4. **Replace Diode D13** with a MA132HK (ICOM part # 1790000830)
5. **Replace Diode D15** with a MA132Wk (ICOM part # 1790000850)
6. Reassemble the radio.
7. Reset the microprocessor if required. (see User Manual for RESET instructions)
8. Press [B] & [#] and turn radio on. (Keyboard Rx Expansion)

Cross Band Repeater Instructions

Set radio to operate in two bands only and set desired frequencies in both bands.
TO ACTIVATE/DEACTIVATE - Press [FUNC] & [MONI] & [ENT] at the same time.

Squelch Function - Push the [S] key and turn the Frequency set Knob for each band.

Note: The [S] key is near the PTT and [Function] switch (left side)



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
 Have the original book with you when you call with a question. **Use at your own Risk!**
 The Author and all other parties take no responsibility for any damages or violations
 caused by these modifications. Some modifications may violate FCC rules.
 (818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

Expansion Range

118 - 136 MHz AM mode (RX only), 136 - 174 MHz FM mode (TX & RX)

320 - 479 MHz FM mode (TX & RX), 850 - 999 MHz FM mode (RX only)

1000 - 1400 MHz FM mode (TX & RX)

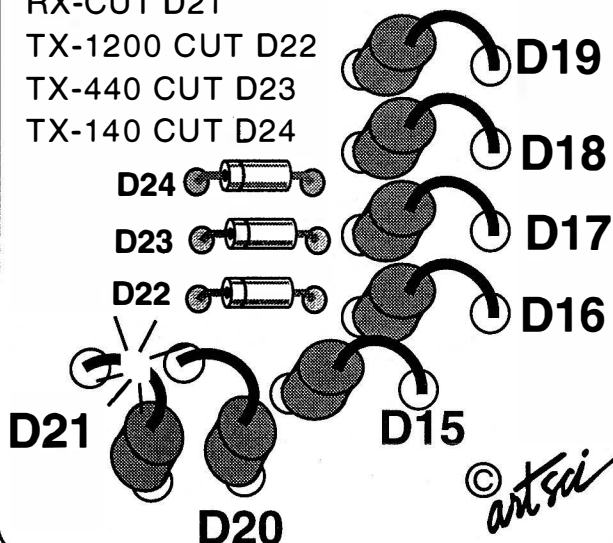
Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

RX-CUT D21

TX-1200 CUT D22

TX-440 CUT D23

TX-140 CUT D24



IC-DELTA 100

© artsci

BSW

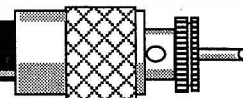
ASW

Expanded RF Modification

1. Remove power and antenna.
2. Remove screws and open the radio.
3. Locate logic board.
4. Locate and **remove Diode D21**. (RX mod)
5. Locate and **remove Diode D22**. (1200 TX mod)
6. Locate and **remove Diode D23**. (440 TX mod)
7. Locate and **remove Diode D24**. (144 TX mod) or jumper W17 may be removed.
8. Reassemble the radio.
9. You may be required to reset the microprocessor. (see owners manual)

Note: Some radios may need Diodes D15, D16 & D17 to be cut for expansion.

Radio/Tech Modifications Volume A



© artsci

Photocopies are a violation of copyright law. © artsci inc. all rights reserved. Have the original book with you when you call with a question. **Use at your own Risk!**

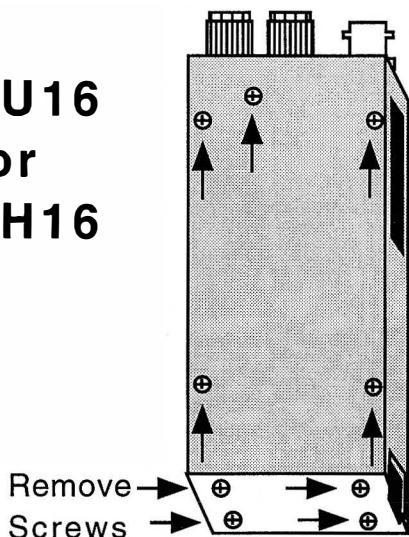
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules. (818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

Expansion Range

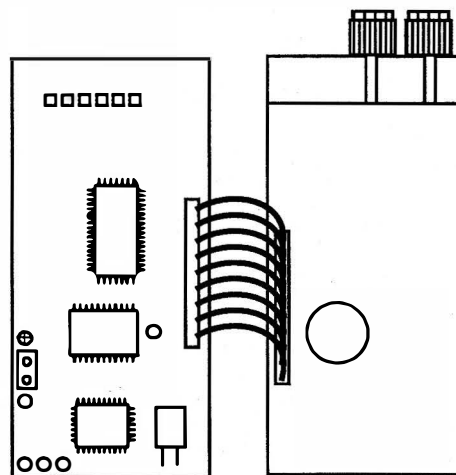
The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

**IC-U16
or
IC-H16**



Remove
Jumper
Plug →

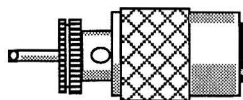


Expanded RF Modification

1. Remove battery and antenna.
2. Remove 9 screws and open Radio.
3. Locate and **remove Jumper plug**.
4. Reassemble the radio.

Programming Commands

- 1) Hold down [FUNCTION] key and press [1] [5] [9] [3] [5] [7].
- 2) Hold down [FUNCTION] and press :
 - [1] - Transmit PL tone. (2 digits)
 - [2] - Receive PL Tone. (2 digits)
 - [4] - Offset in MHz. (i.e.. +05000 =+5 MHz)
 - [5] - Frequency.
 - [7] - Rename Ch#
 - [8] - Time out Timer
 - [9] - TX Inhibit
- 3) Enter #'s and press [ENTER].
- 4) To Exit Programming mode Hold [FUNCTION] and press [CLR].



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

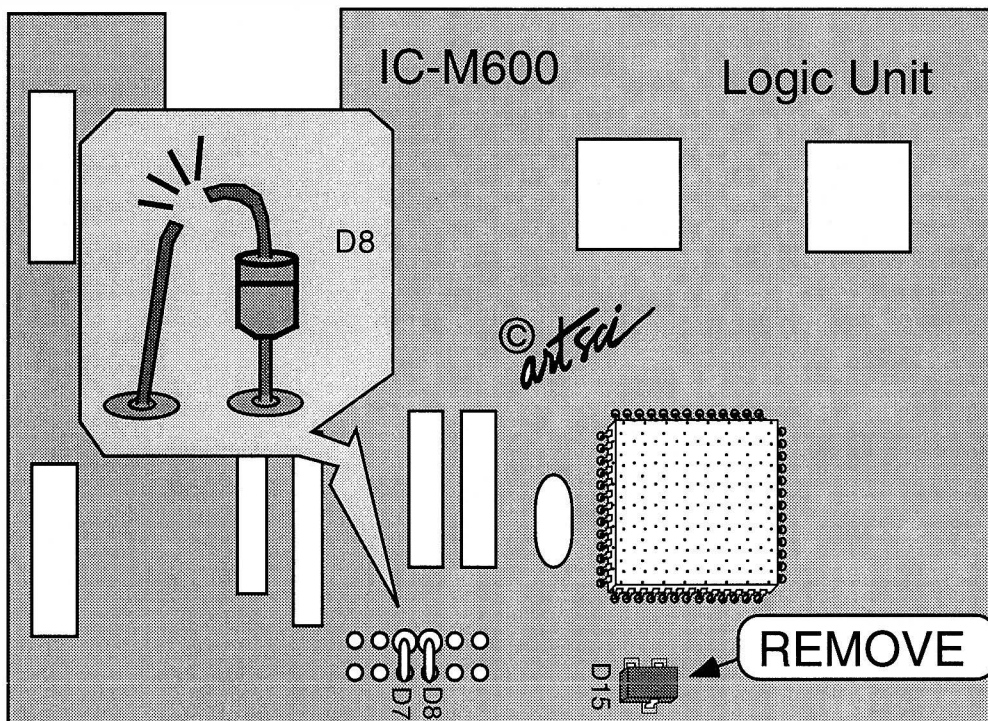
© artsci

Expansion Range

The Exact range of this radio is not know as of press time.

Expanded RF Modification

1. Remove power and antenna.
2. Open radio and find LOGIC unit.
3. Locate and **cut Diode D8**.
4. Locate and **remove Diode D15**.
5. Reassemble the radio.

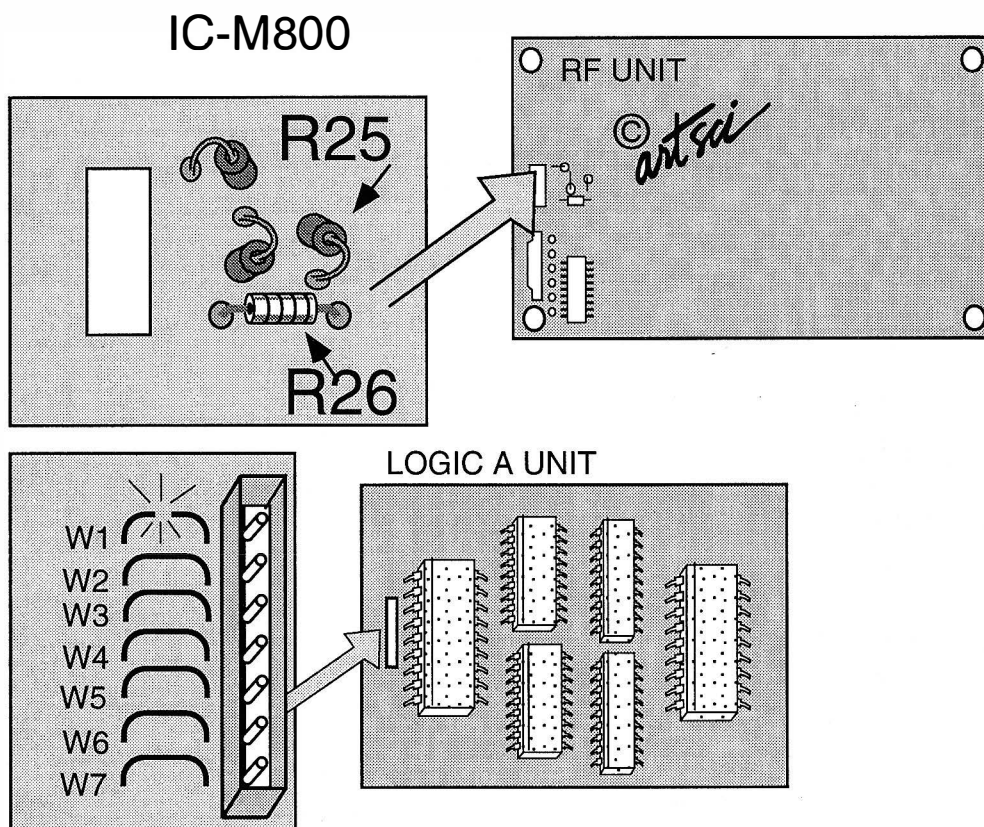


LSB MODE

1. Press and hold [MODE] button and turn power on.
2. Select LSB mode with Mode button.
3. Press [RX] button
4. Press [TX] button
5. Turn the radio off

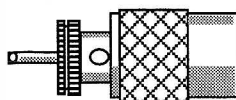
Expansion Range

The Exact range of this radio is not know as of press time.



Expanded RF Modification

1. Remove power and antenna.
2. Open radio and find RF unit.
3. Locate and **cut Resistor R25 & R26**.
4. Locate Logic A unit.
5. Locate and **cut jumper W1**.
6. Reassemble the radio.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

Performance Report

Radio _____

Date _____

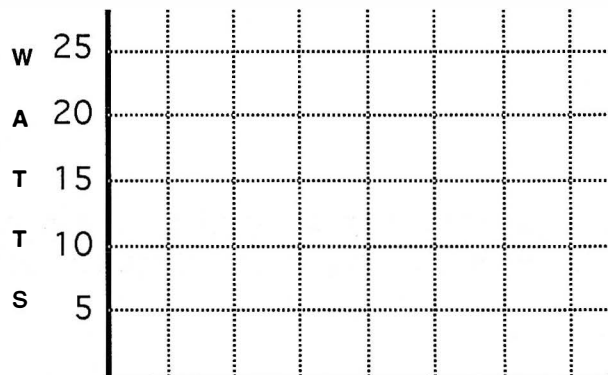
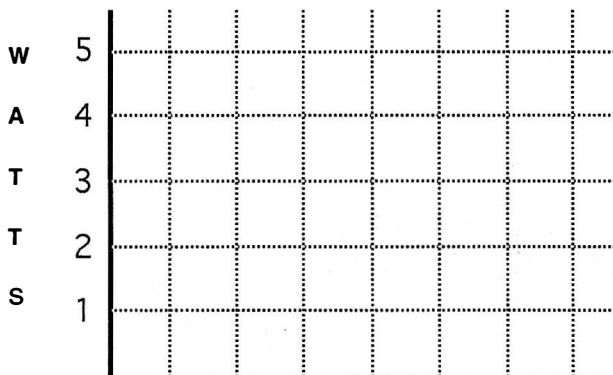
Owner : Name _____

Address _____

City _____ St. _____ Zip _____

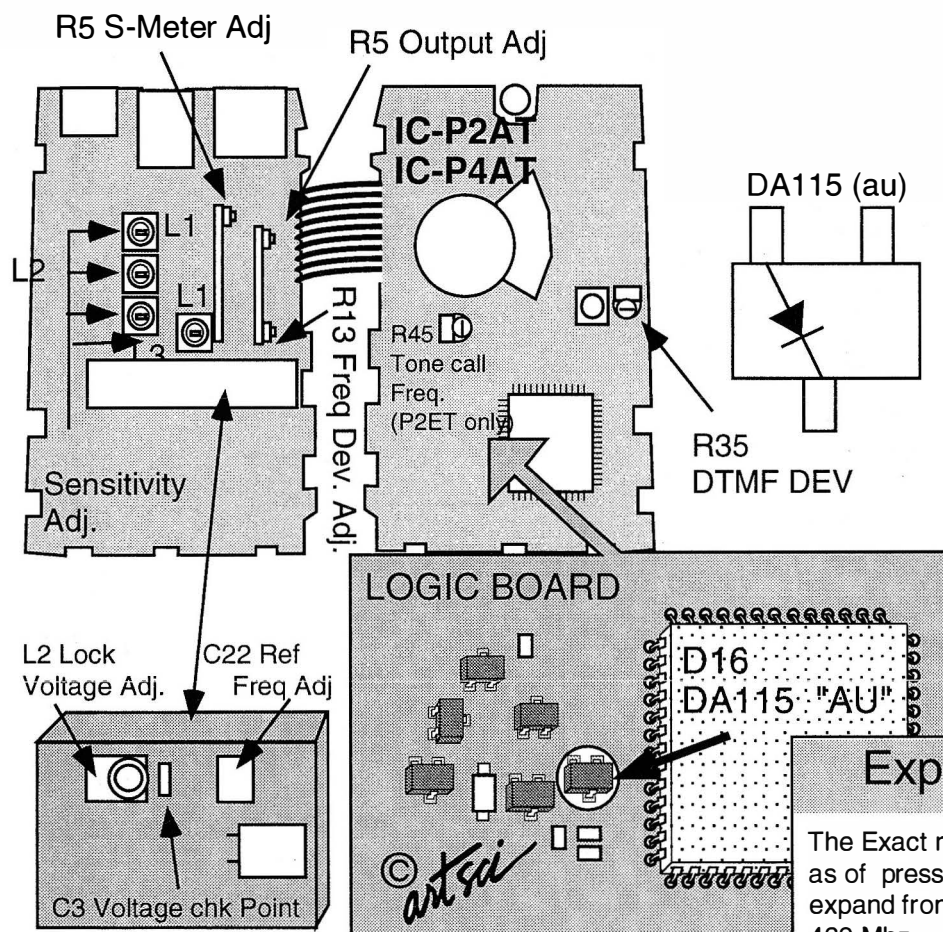
Phone () - _____

Description	Before	After
Power out (Low)	_____ Watts	_____ Watts
Power out (High)	_____ Watts	_____ Watts
Frequency Error (Simplex)	_____ Hz	_____ Hz
Frequency Error (Offset)	_____ Hz	_____ Hz
Receive Sensitivity (Mid-band)	_____ uv	_____ uv
Receive Sensitivity (_____ MHz)	_____ uv	_____ uv
Receive Sensitivity (_____ MHz)	_____ uv	_____ uv
PL Deviation	_____ Hz	_____ Hz
DTMF Deviation	_____ KHz	_____ KHz
Audio Deviation	_____ KHz	_____ KHz
Lowest usable Freq @ .5 Pwr	_____ MHz	_____ MHz
Highest usable Freq @ .5 Pwr	_____ MHz	_____ MHz



Expanded RF Modification

1. Remove battery and antenna.
2. Remove screws and open radio.
3. **Install Diode D16** (symbol AU, DA115) (see drawing).
4. Reassemble radio.
5. **Reset Microprocessor.**
(Press and hold [FUNC] and [V/M] and turn on.
Wait for display to normalize before releasing buttons)
You may need to open the Receiver first:
Press and hold [LIGHT] & [B] & [#] and turn on.
Set PL to 100 Hz and then RESET the Microprocessor.



Expansion Range

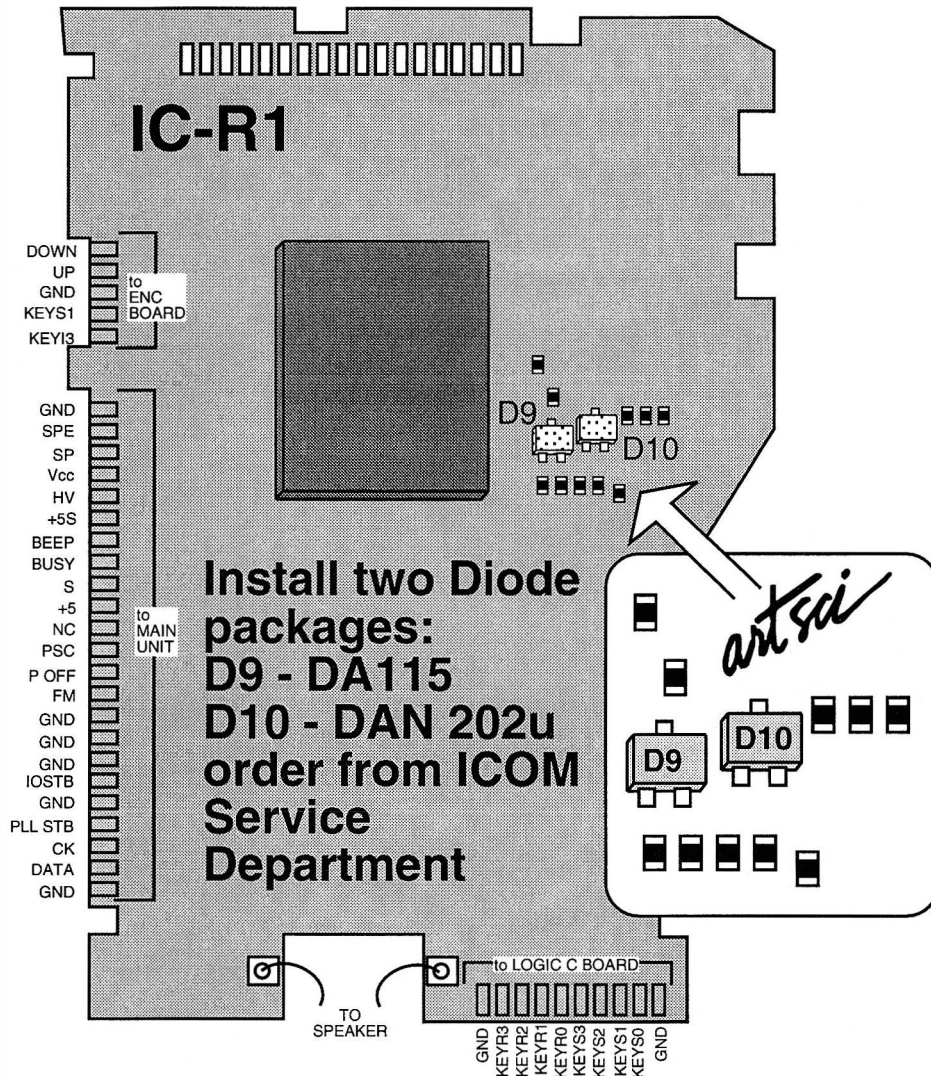
The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci



Expansion Range

This modification will restore the entire 800 MHz band. Early models of this scanner did not require a modification.

800 MHz Restoration

1. Remove Battery and antenna.
2. Remove screws and open radio.
3. Locate Logic board
(keyboard side of radio)
4. Install new Diodes D9 & D10.
5. Reassemble the radio.
6. Reset the microprocessor if needed.
(see user manual)

Radio/Tech Modifications Volume A

©artsci

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
 Have the original book with you when you call with a question. **Use at your own Risk!**
 The Author and all other parties take no responsibility for any damages or violations
 caused by these modifications. Some modifications may violate FCC rules.
 (818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

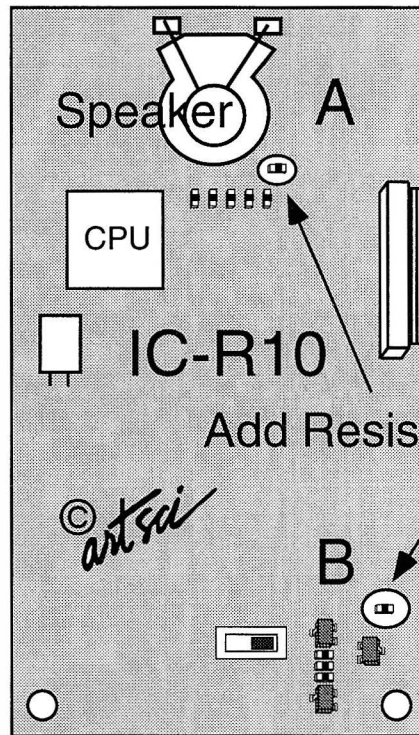
Receive and Transmit Expansion

ICOM

IC-R10

Expansion Range

800 MHZ restore



To Rear Panel

Add Resistor to Points 'A' & 'B'.

10 k chip diodes have 103 printed on to



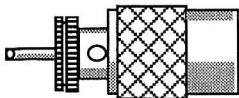
Expanded RF Modification

1. Remove battery and antenna.
2. Remove screws open case.
3. Locate logic board.
4. **Add 10k resistors to pads 'A' & 'B'.**
5. Reset the microprocessor. (see user manual)
6. Reassemble the radio.



CAUTION:

This modification requires soldering or desoldering CMOS components. It requires special CMOS rated equipment and familiarity with surface mount soldering techniques.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

ICOM - 77

Performance Report

Radio _____

Date _____

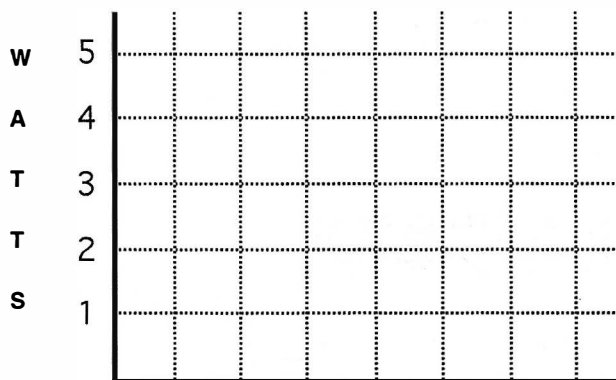
Owner : Name _____

Address _____

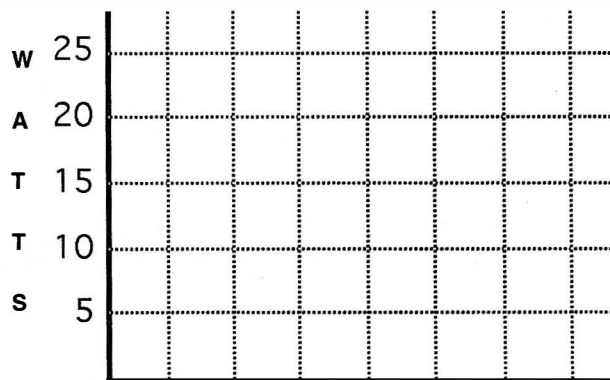
City _____ St. _____ Zip _____

Phone () - _____

Description	Before	After
Power out (Low)	_____ Watts	_____ Watts
Power out (High)	_____ Watts	_____ Watts
Frequency Error (Simplex)	_____ Hz	_____ Hz
Frequency Error (Offset)	_____ Hz	_____ Hz
Receive Sensitivity (Mid-band)	_____ uv	_____ uv
Receive Sensitivity (____ MHz)	_____ uv	_____ uv
Receive Sensitivity (____ MHz)	_____ uv	_____ uv
PL Deviation	_____ Hz	_____ Hz
DTMF Deviation	_____ KHz	_____ KHz
Audio Deviation	_____ KHz	_____ KHz
Lowest usable Freq @ .5 Pwr	_____ MHz	_____ MHz
Highest usable Freq @ .5 Pwr	_____ MHz	_____ MHz



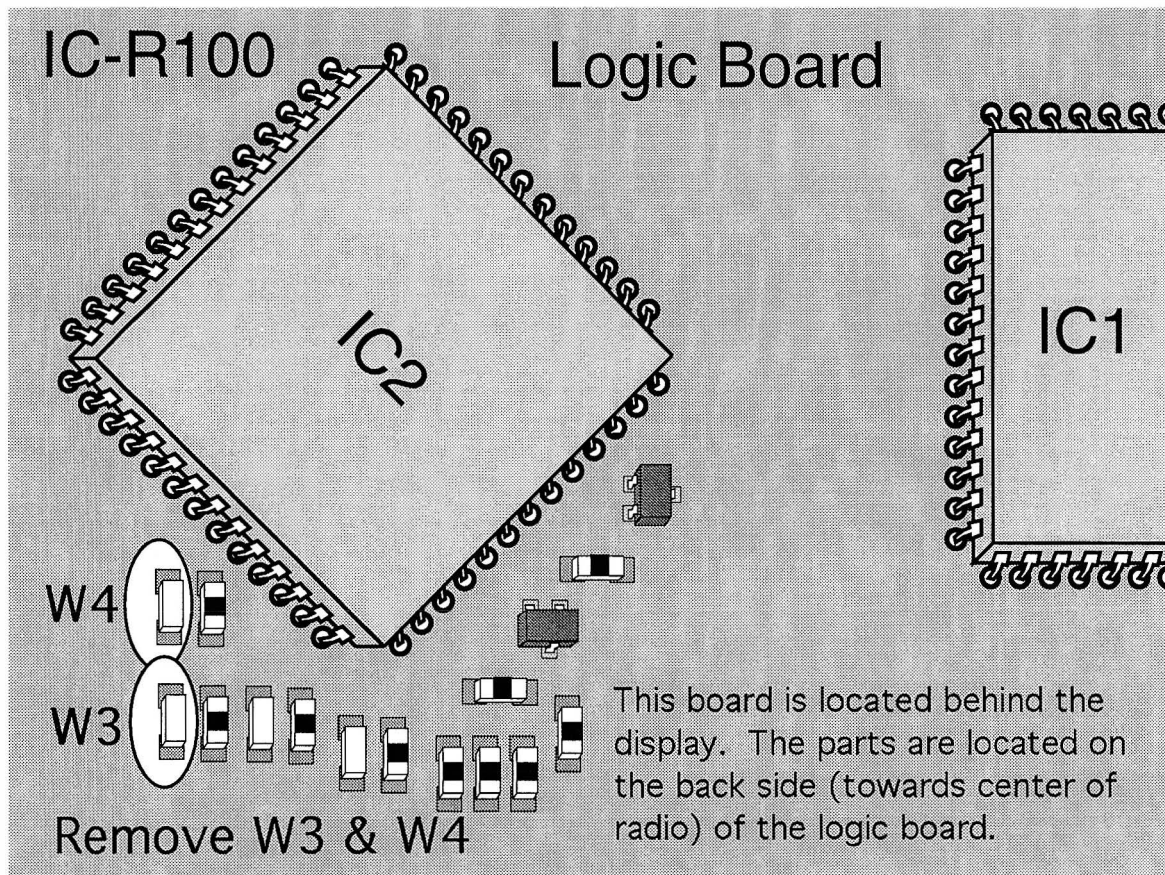
Frequency



Frequency

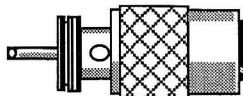
Expansion Range

This modification will restore the entire 800 MHz band. Early models of this scanner did not require a modification.



800 MHz Restoration

1. Remove Power and antenna.
2. Remove screws and open radio.
3. Locate Logic board
4. **Remove Jumpers W3 & W4.**
5. Reassemble the radio.
6. Reset the microprocessor if needed.
(see user manual)



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

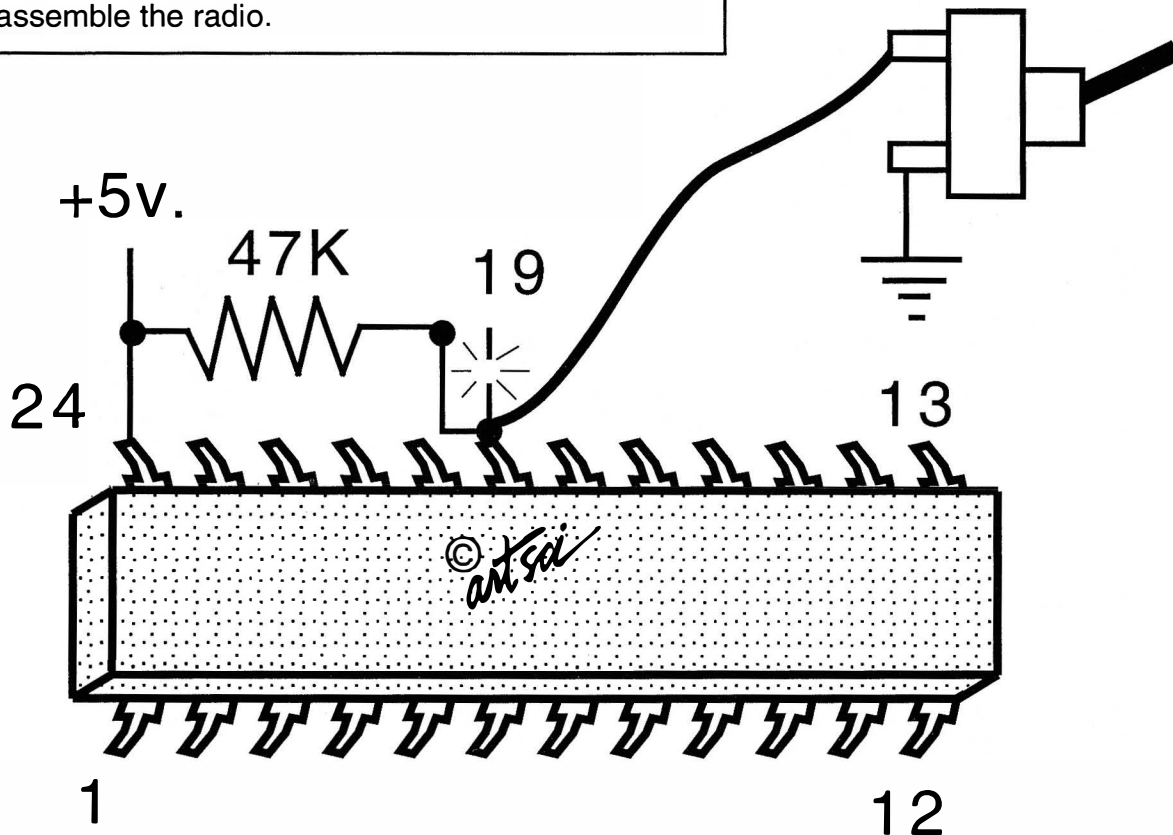
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

Expanded Memory Modification

1. Remove power and antenna.
2. Remove screws and open case.
3. Locate the logic board.
4. Locate pin 19 on IC-8.
5. **Cut foil trace to ground.**
6. **Attach a 47K Ohm resistor and a switch as shown.**
7. Reassemble the radio.



Operation

When the switch is closed, memory channels 0-99 will operate.
When the switch is open, memory channel 100-200 will operate.

Scanning will operate in only one memory bank at a time.

Expansion Range

After this modification, the radio will receive down to 5 kHz.

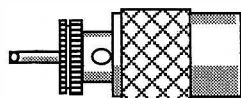
Expanded RF Modification

1. Enter the memory channel mode and select any memory channel.
2. Push the [FUNCTION] key and [CLEAR MEMORY] button.
3. Tune (rock) memory channel knob and the main dial at the same time.
Keep rocking both until frequency display goes to 00.00.
4. Tune UP only! If you tune down the display will return to 96 kHz.

Display Failure

Replace the following components:

C14 = 33 μ 16v.
C20 = 10 μ 16v.
C15 = 4.7 μ 25v.
C17 = 3.3 μ 50v.
C18 = 0.1 μ 50v.
C21 = 10 μ 16v.
C19 = 10 μ 16v.
C22 = 10 μ 16v.
C16 = 3.3 μ 50V.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

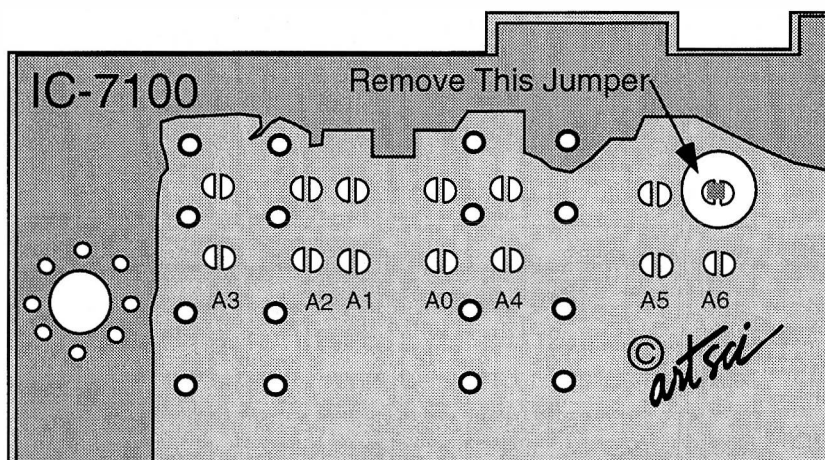
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

Expanded RX Modification

1. Remove power and antenna.
2. Remove screws and open case.
3. Locate LOGIC Board.
4. Locate jumper (see drawing) and remove jumper.
(see manuals Page 38 for location)
5. Reassemble the radio.





RS-232 Connector

IC-R8500

© artsci

R-517

R-516

R-518

ICOM

Expanded RF Modification

1. Remove Power and antenna.
2. Remove 10 screws on the top cover (NOT THE SPEAKER SCREWS)
3. Carefully remove the top cover (UNPLUG THE SPEAKER)
4. Locate the main board (it is a large board towards the rear of the radio)
5. Locate and remove the metal shield can
It is near the right rear of the radio and in front of the RS-232 connector.
6. Locate and remove **Resistor R-517**
7. Replace the metal shield.
8. Locate and **install R-455** (1K chip resistor 102)
There is an empty resistor pad directly behind the metal shield.
9. Reassemble the radio
10. Reset the microprocessor if required.

CAUTION:

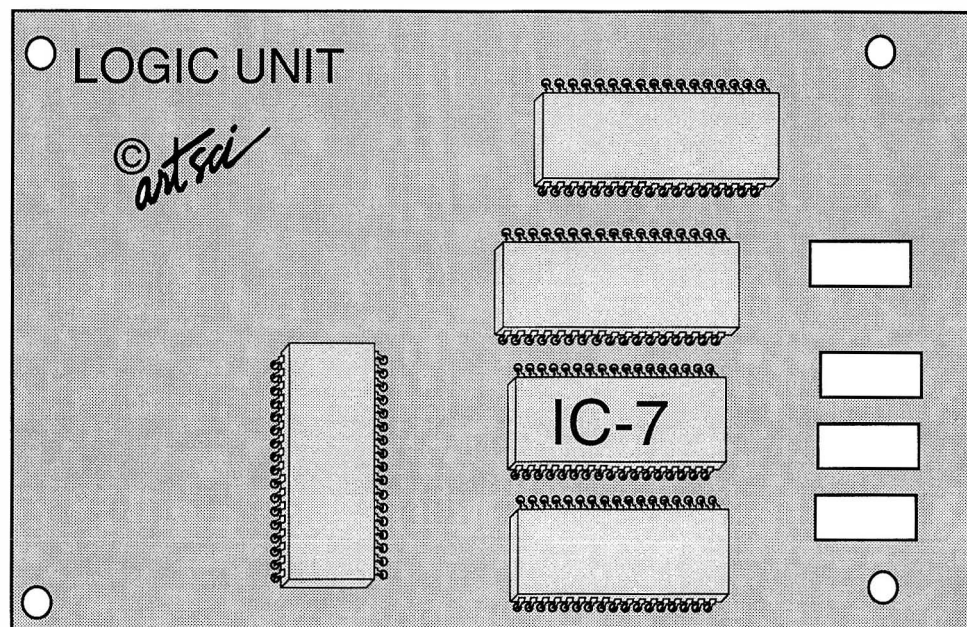
This modification requires soldering or desoldering CMOS components. It requires special CMOS rated equipment and familiarity with surface mount soldering techniques.

Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

IC-RP1220
IC-RP1520
IC-RP4020
IC-RP4520



Expanded RF Modification

1. Remove power and antennas
2. Remove bottom cover (12 screws)
3. Locate and remove IC-7 (it is in a socket)
4. **Install a new IC-7** (Part # SC1222 ICOM Part # 900-08922)
5. Reset cover and screws.

Note: No reset is required.

Receive and Transmit Expansion

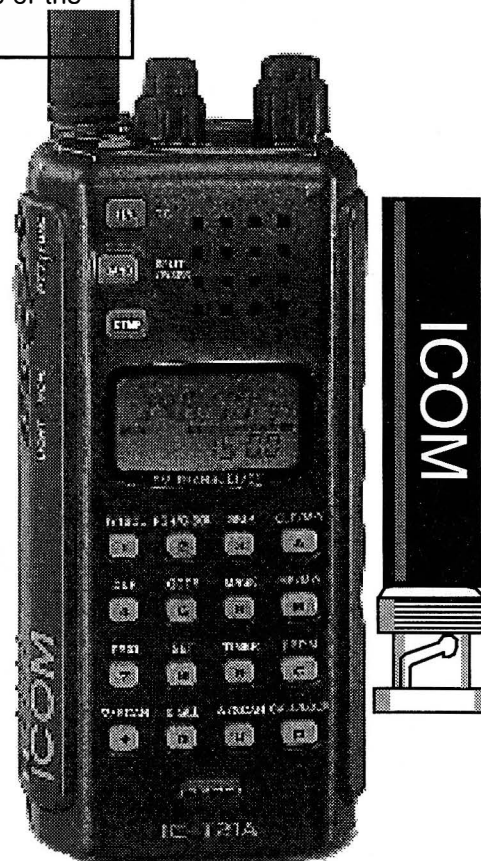
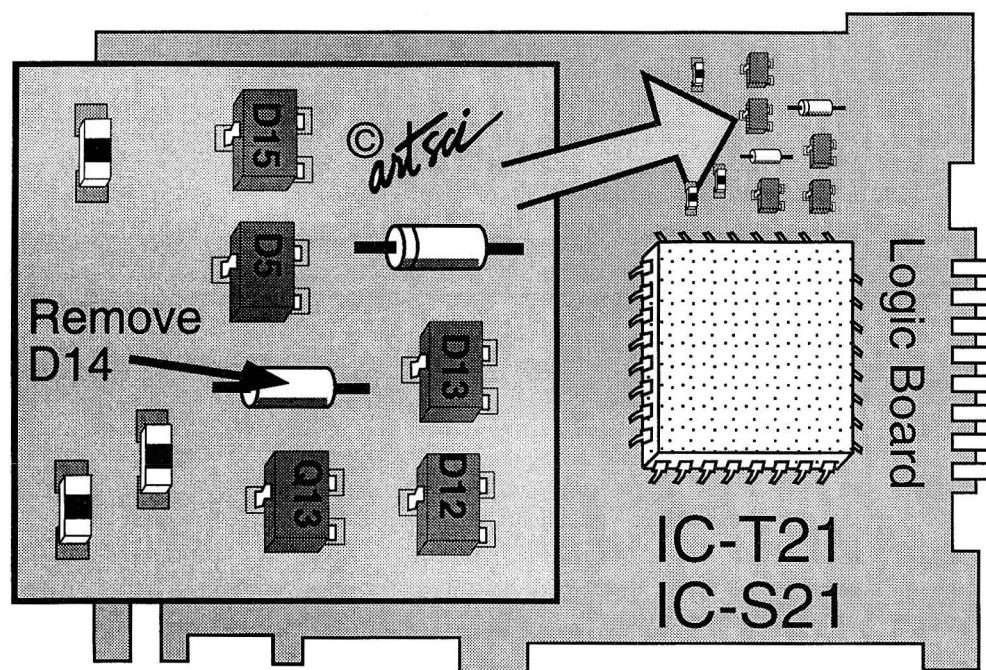
ICOM

Expansion Range

T21: 108 - 136 MHz AM (RX only), 136 - 174 MHz FM mode (TX/RX), 400 - 490 MHz (RX)
T41: 108 - 136 MHz AM (RX only), 136 - 174 MHz FM mode (RX), 400 - 490 MHz (TX/RX)
S21: 108 - 136 MHz AM (RX only), 136 - 174 MHz FM mode (TX/RX)
S41: 400 - 490 MHz (TX/RX)

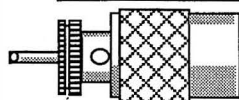
Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

IC-S21
IC-S41
IC-T21
IC-T41



Expanded RF Modification

1. Remove battery and antenna.
2. Open radio.
3. Locate Logic Board
4. Locate and **remove Diode D15** (RX Mod)
5. Locate and **remove Diode D14** (TX Mod)
6. Install a chip jumper in position W2 on the UHF PLL board next to IC2.
Near board edge (board # B3921E)
6. Reassemble the radio
7. T21 & T41 : **Press and hold [B] & [#] and turn power on.**
S21 & S41 : **Press and hold [MONI] & [LIGHT] & [V/M] and turn power on.**



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

ICOM - 85

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz
The Display will show 100MHz - 200MHz but the electronics will not tune the entire range.

Expanded RF Modification

1. Remove power and antenna.
2. Remove screws open case.
3. Locate and **remove D-34** (RX Mod)
4. Locate and **remove D-18** (TX Mod)
5. Reassemble the radio.
6. Reset the microprocessor. IF NEEDED - *A+C - POWER ON*
See user manual for precedure
FREQ. CH - ▼ + O - POWER ON

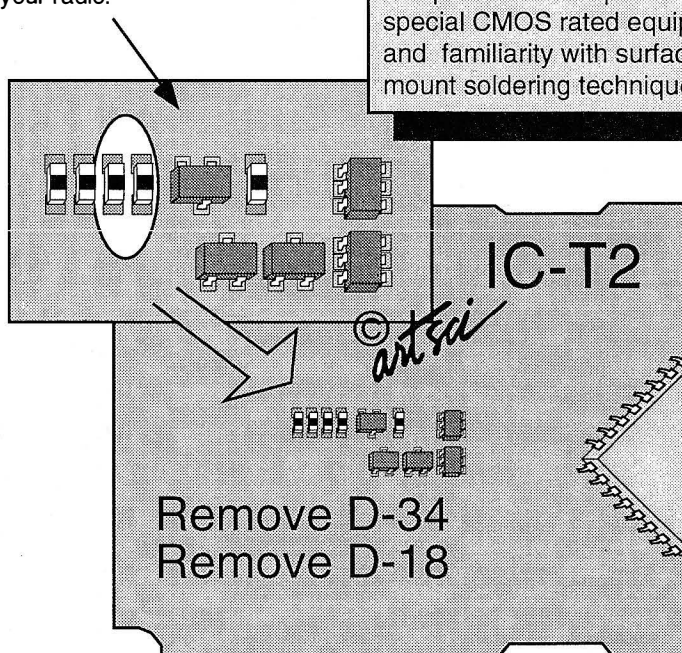
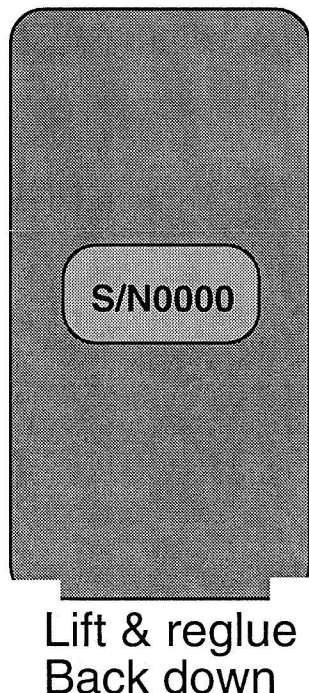
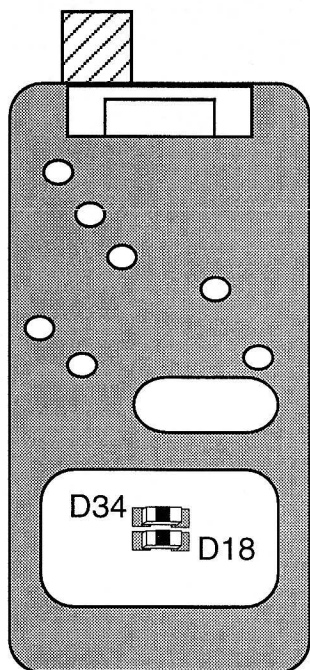
RX Expansion:

Press and hold [SP] & [UP SCAN arrow Down] and turn the radio on, hold down for 5 seconds

This BLOW-UP drawing is intended to help you locate the proper parts.
The parts presented here are for reference only. Not all these parts may be present in your radio.

CAUTION:

This modification requires soldering or desoldering CMOS components. It requires special CMOS rated equipment and familiarity with surface mount soldering techniques.



Expansion Range

118 Mhz - 174 Mhz
400 Mhz - 469 Mhz.

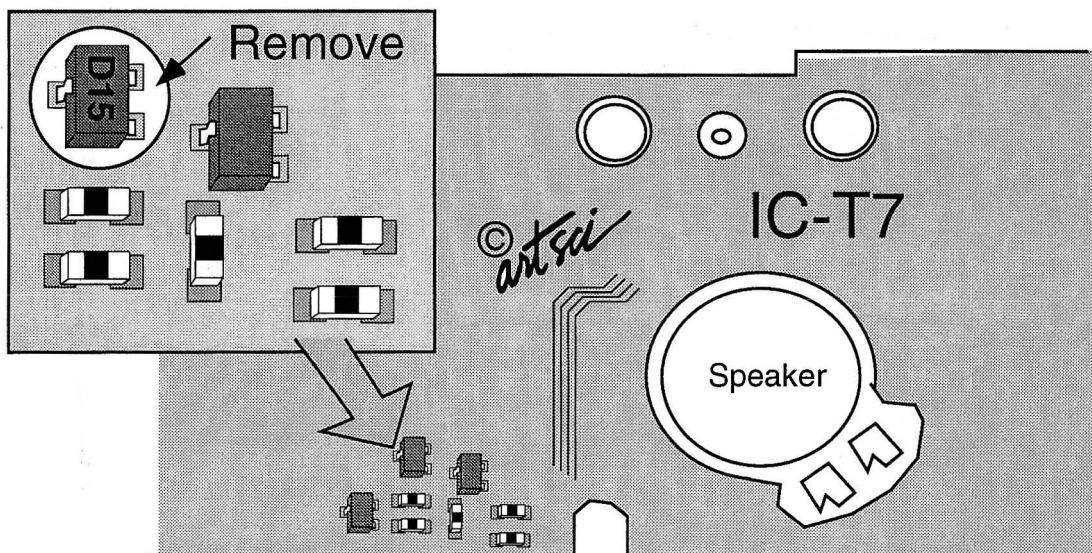
Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

Expanded RF Modification

1. Remove power and antenna.
2. Remove screws open case.
3. Locate LOGIC board.
4. **Remove Diode D15** located on the Logic board
5. Reset the microprocessor (if needed).
6. Reassemble the radio.

For Receive only expansion:

Press and hold [BAND] & [MONITOR] and turn the power on,
 Hold for 5 seconds.



Before RX Expansion

VHF: 118-174 MHz
 AM RX: 118-135.995 MHz
 FM Rx: 136-174 MHz
 UHF: 400-470 MHz

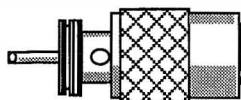
After RX Expansion

VHF: 50-199.995*
 AM Rx: 108-174 MHz
 Additional FM Rx: 300-3999.995
 UHF: 400-599.9995 MHz**
 Additional UHF: 600-999.999 MHz ***

* Although the display shows the expanded frequency range, the usable range is between 108-174 MHz

**Workable FM is between 400-540 MHz, The VCO will unlock above 540 MHz.

*** Usable FM RX is 610-999.990 with cell band blocked (969-894 MHz)



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

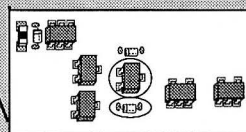
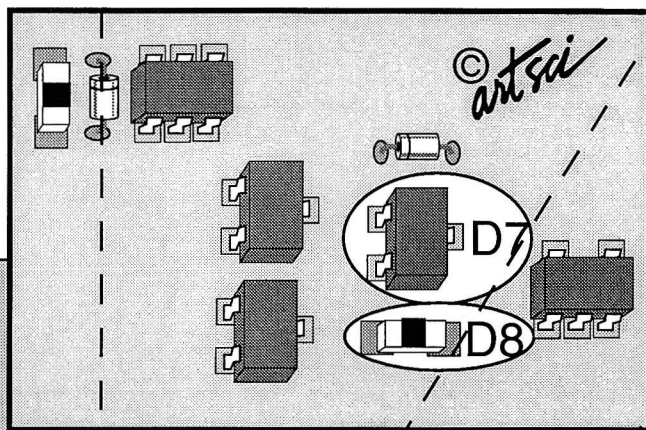
artsci

Expansion Range

RX: 118 MHz - 135.99 MHz AM

TX: 136 MHz - 174 MHz FM

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



IC-T22
Logic Board

Expanded RF Modification

1. Remove power and antenna.
2. Remove screws open case.
3. Locate Logic board (it has the hold for the speaker).
4. **Remove Diode D7** (RX Modification).
5. **Remove Diode D8** (TX Modification).
6. Reassemble the radio.

Keyboard RX Expansion -

Press [B] & [#] while tuning the radio on. Hold for 3-5 seconds.

Frequency entry modification (enter all 6 digits)

Press [Func] & [8]

Press frequency up arrow to bring "1 PL" option.

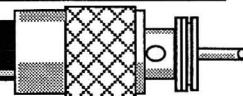
Dial PL to 100 Hz

Press [CLEAR]

Rx Expansion

10-999.9 MHz

Radio/Tech Modifications Volume A

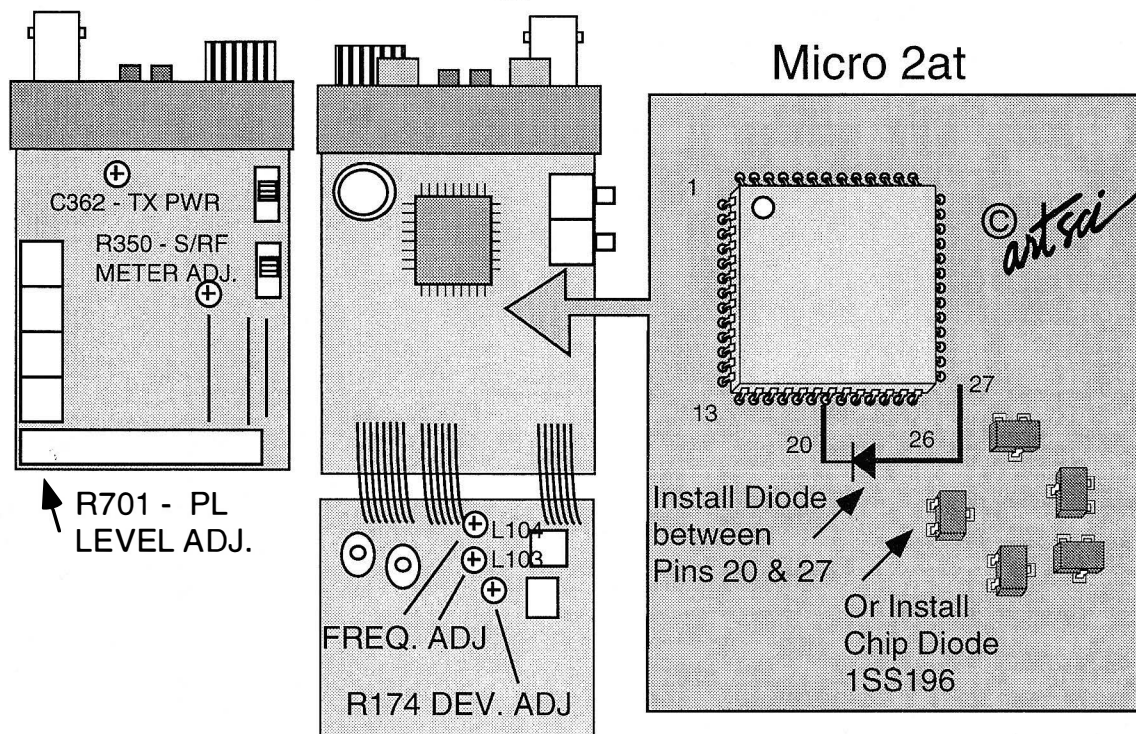


©artsci

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz.

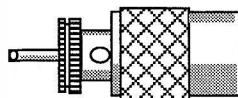
Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Note: This diode is placed across pin 20 & 27 of CPU. Drawing is not to Scale.
MICROPROCESSOR is under the Tone Pad (under shield)

Expanded RF Modification

1. Remove battery and antenna.
2. Remove 4 screws and open Radio.
3. Separate shield & top circuit board from bottom board.
4. Locate Microprocessor board.
5. Tack **solder a 1N914 Diode** across Pin 20 & 27
or attach a chip Diode 1SS196 as shown.
6. Reassemble the radio.
7. Reset the microprocessor.
(Push and hold [lamp] and turn on power.)



Radio/Tech Modifications Volume A

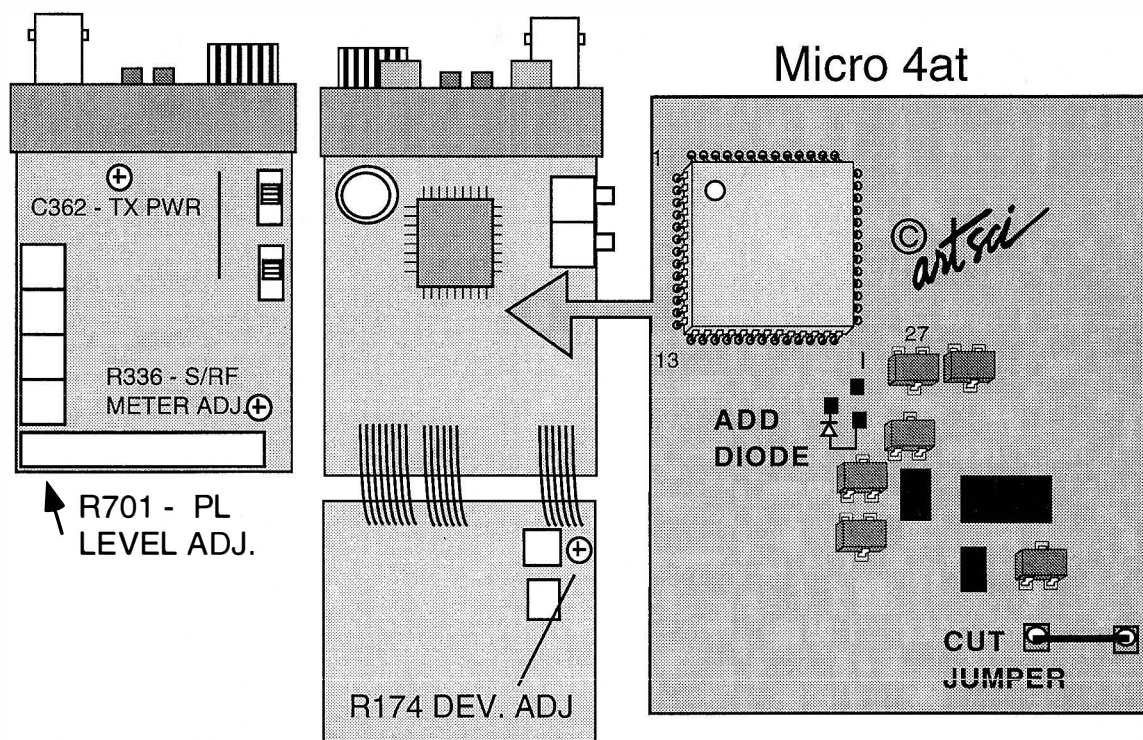
Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 420 - 469 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

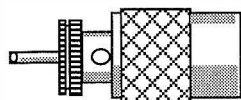
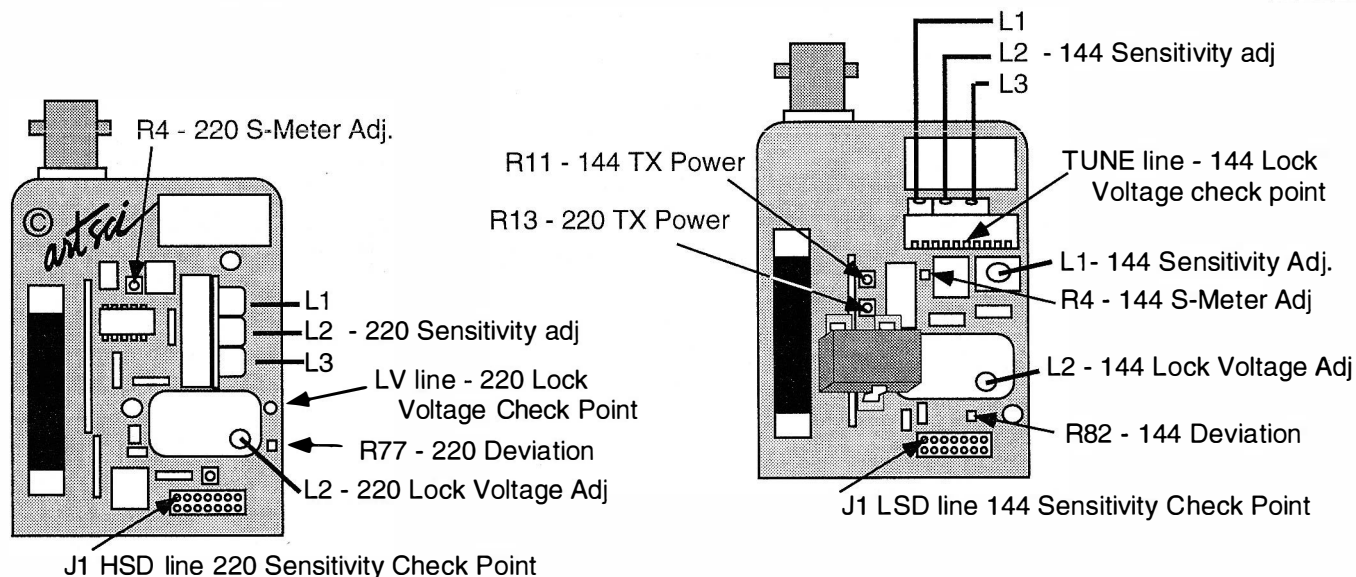
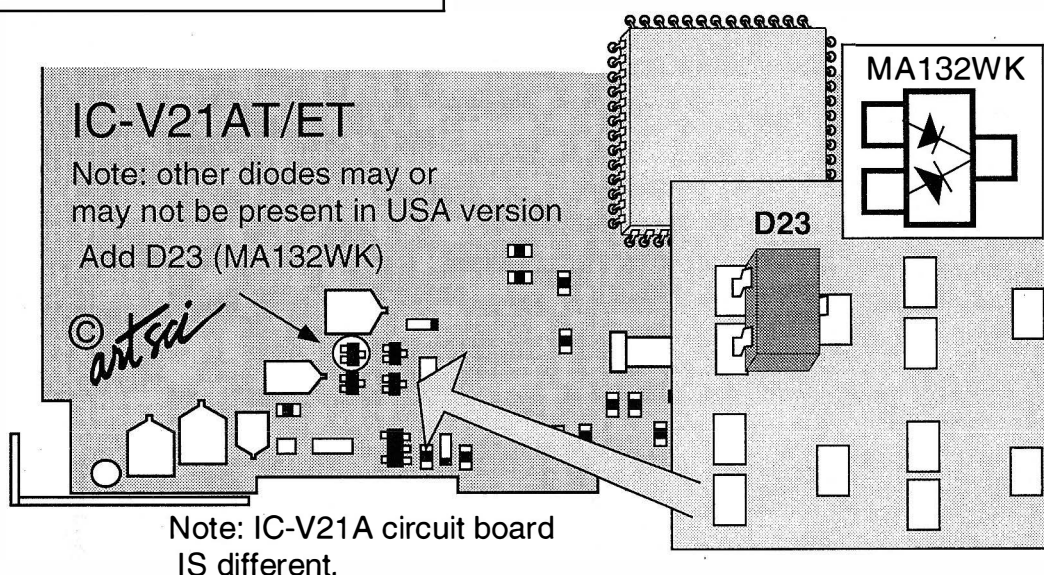
1. Remove battery and antenna.
2. Remove 4 screws and open Radio
4. Tack **solder a 1N914 Diode** across chip diode position.
or attach a chip Diode 1SS196.
5. Reassemble the radio.
6. **Reset the microprocessor.** (Push and hold lamp and turn on power.)

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz. Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

Expanded RF Modification

1. Remove battery and antenna.
2. Remove screws from back panel and battery plate and open radio.
3. Locate and **cut Diode D23** on logic unit.
4. Reassemble the radio.
5. **Reset the microprocessor.**
(Press and hold [FUNC] & [A] & [*] & turn power on)



Radio/Tech Modifications Volume A

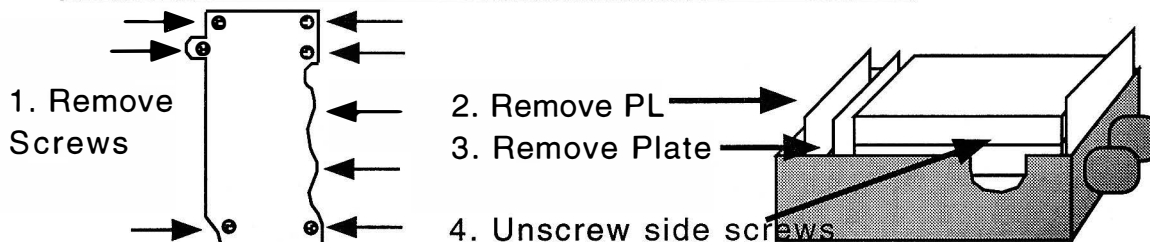
Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

artsci

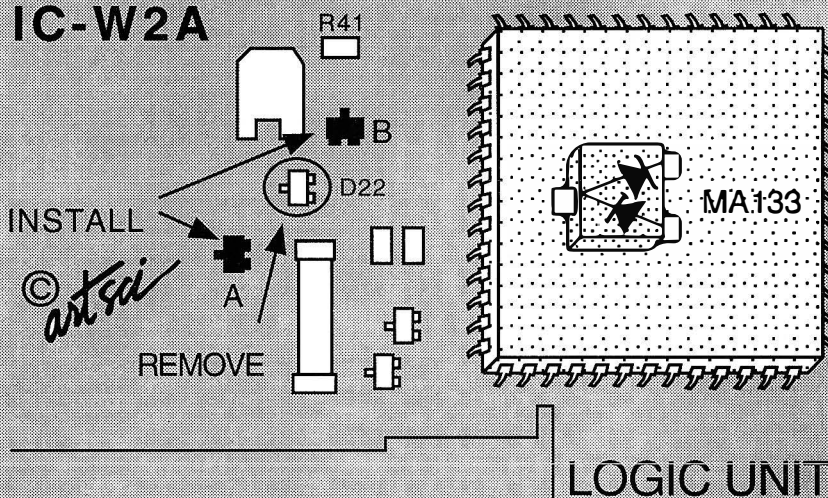
IC-W2
IC-X2

Keyboard Commands

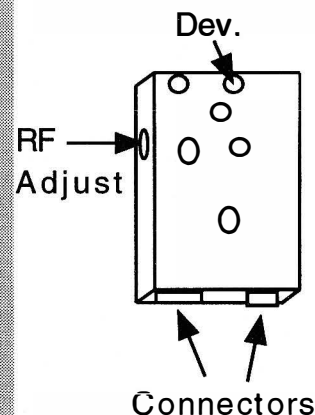
RX Expansion Direct Entry	Push and hold [#] & [B] & [3] and turn power on. Set VFO PL to 100 Hz on VHF and UHF!!!! [F] & [SET] to select 1, 10, or 100 MHz freq. entry.
XBand Repeat on	Hold [FUNCTION] press [2] and then [#].
XBand Repeat off	Push and hold [FUNCTION] & [#].
Display Test	Push and hold [#] & [LIGHT] & [B]



IC-W2A



RF Decks



Expanded RF Modification

1. Remove battery and antenna.
2. Remove screws from back panel and battery plate and open radio.
3. Remove PL deck and power plate.
4. Unplug VHF & UHF decks.
5. **Remove Chip diode D22.**
6. **Attach Chip diodes** to location points A & B.
(Diode MA133 - ICOM part # 1790000860)
7. Reassemble the radio.
8. **Reset the CPU**
(Push and hold [FUNCTION] & [A] & [CLR] and turn radio on)

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz.
Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

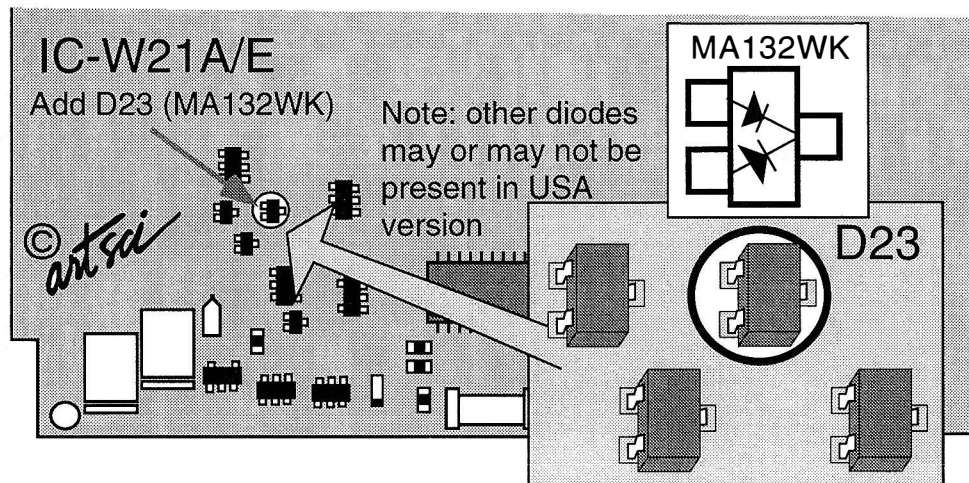
Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

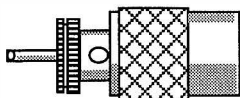


Expanded RF Modification

1. Remove battery and antenna.
2. Remove screws and open radio.
3. Locate LOGIC board.
4. Locate position D23 and **add Diode D23 (MA132WK)**
5. Reassemble the radio.
6. **Reset the Microprocessor** (Press [LIGHT] +[MONI] & turn power on)
7. **Enter Expand function** (Press [LIGHT] +[MONI] + [V/M] & turn power on)

Crossband Repeater Instructions

1. Press [LIGHT] & [V/M] & turn power on
 2. Set frequencies.
 3. Press [FUNC] & [LIGHT] - Lock Frequencies
 4. Turn radio off
 5. Press [FUNC] & [MONI] & [RPT] & turn power on. (Press [MONI] to stop TX.)
- CLEAR : Press [FUNC] & [LIGHT]



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

IC-W21AT

Expansion Range

108 - 138 MHz AM RX, 136 - 179 MHz FM RX,
311 - 460 MHz FM, 800 - 945 MHz

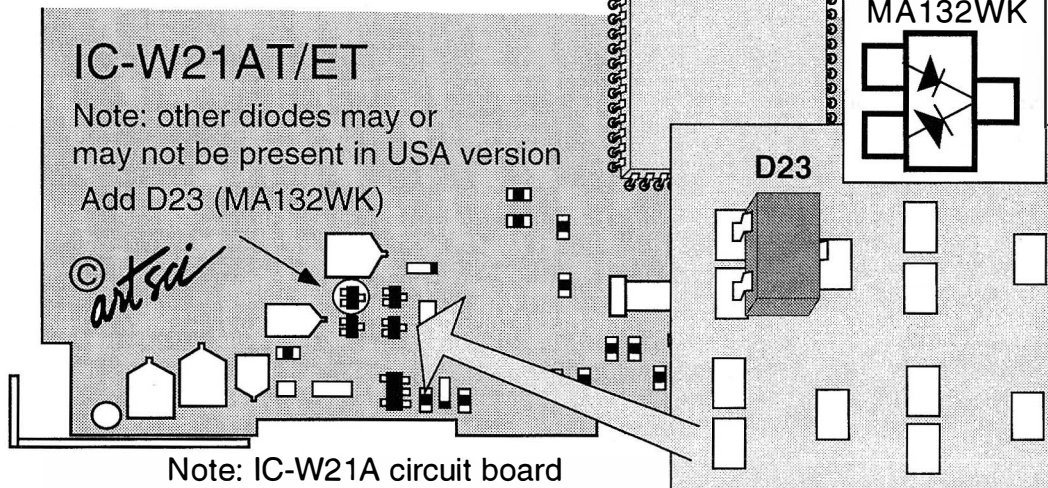
Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

Cross band Repeater Instructions

1. Set Both VHF & UHF frequencies
 2. Set [KEY LOCK] and press [F] and turn power off
 3. Press [F] & [MONI] & [RPT-M] and turn power on.
- CLEAR : Press [F] & [C]

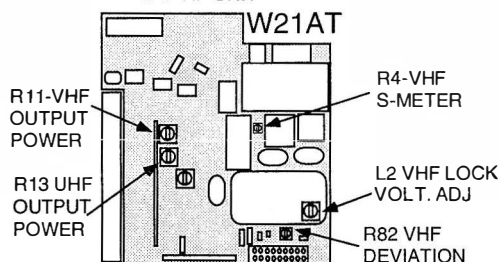
IC-W21AT/ET

Note: other diodes may or may not be present in USA version
Add D23 (MA132WK)

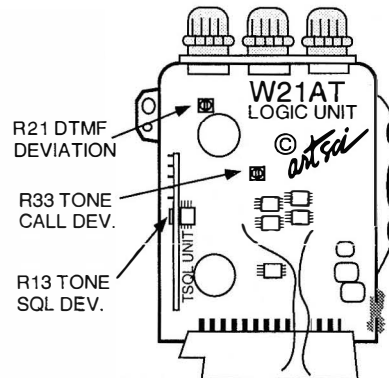
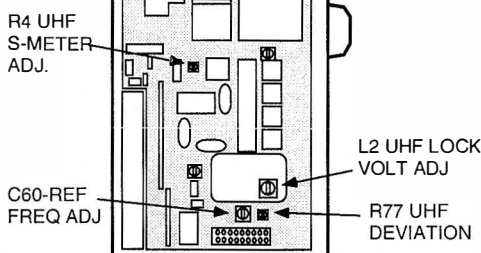


Note: IC-W21A circuit board IS different.

VHF RF UNIT



UHF RF UNIT W21AT



Expanded RF Modification

1. Remove battery and antenna.
2. Remove screws and open radio.
3. Locate LOGIC board.
4. Locate position D23 and **add Diode D23 (MA132WK)**
5. Reassemble the radio.
6. **Reset the Microprocessor** (Press [FUNC] +[A] + [V/SCAN] & turn power on)
7. **Enter Expand function** (Press [B] & [#] & turn power on)

Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

Receive and Transmit Expansion

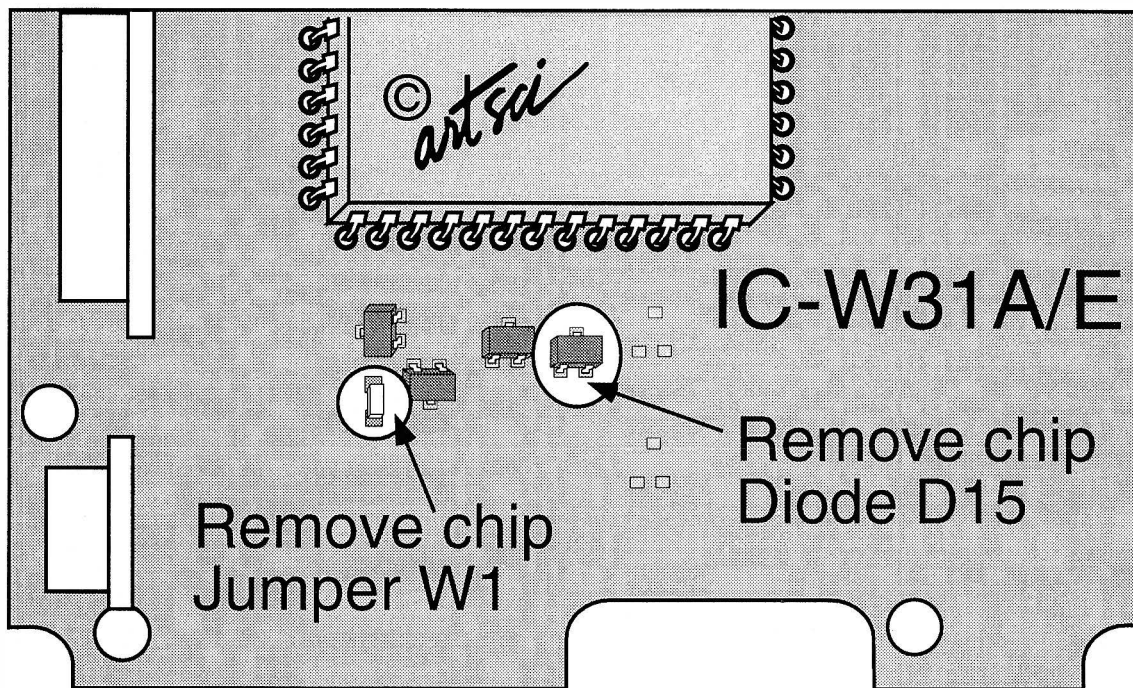
ICOM
IC-W31A

Expansion Range

RX: 108-172 MHz, 300 - 600 MHz, 800 - 900 MHz

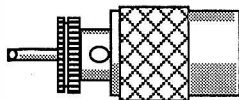
TX: 138 - 180 MHz, 400 - 480 MHz

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Remove power and antenna.
2. Remove screws and open the casecase.
3. Locate Logic unit (front section near Keyboard and has a hole for the speaker)
4. **Remove chip diode D15** (TX Mod)
5. **Remove chip jumper W1** (800 rx Mod)
6. Reassemble the radio.
7. **Reset the microprocessor.**
(press and hold [B] & [#] & turn power on)



Radio/Tech Modifications Volume A

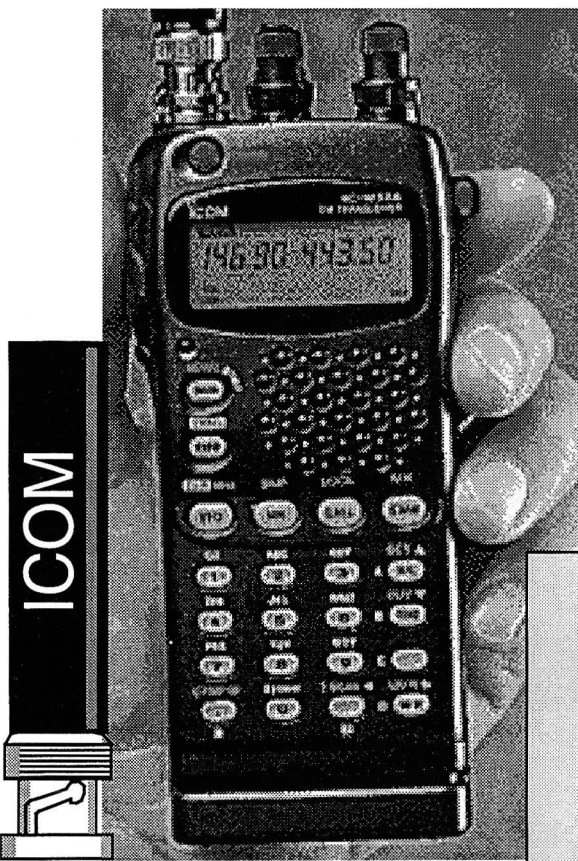
Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

ICOM - 95

IC-W32A/E

This mod is for the IC-W32A
and the IC-W32E



Expanded RF Modification

1. Remove battery and antenna.
2. Remove screws from back panel and battery plate and open radio.
3. Locate main logic board.
4. **Remove Diode D23** in position shown. (D23 is a MA132WK)
5. Reassemble the radio.
6. Reset the microprocessor, if required.

Keyboard RX Expansion :

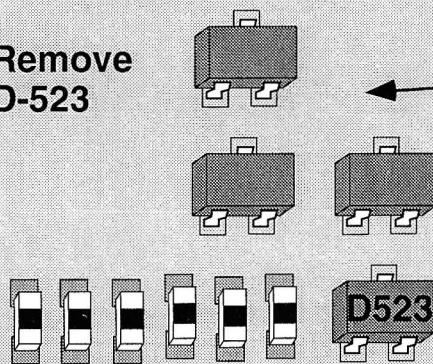
Press and hold [BAND] & [SQUELCH] & turn the power on, don't release for 5 seconds.

CROSS BAND REPEATER

Lock the Keyboard

Press and hold [SQL] & [MAIN] & [BAND] & turn the power on
TURN OFF - Unlock the Keyboard.

Remove
D-523



This BLOW-UP drawing is intended to help you locate the proper parts.
The parts presented here are for reference only. Not all these parts may be present in your radio.

RX Expansion Range

Before RX Expansion

---- LEFT SIDE ----

FM Rx: 136-174 MHz & 400-470 MHz

---- RIGHT SIDE ----

FM Rx: 136-174 MHz & 435-454.995 MHz

Wx: 1-10 (Weather)

AM Rx: 118-135.995

After RX Expansion

---- LEFT SIDE ----

400-599.995*

600-999.990 MHz**

FM Rx: 300-399.995 MHz

---- RIGHT SIDE ----

FM Rx: 136-199.995 MHz***

FM Rx: 435-454.990 MHz

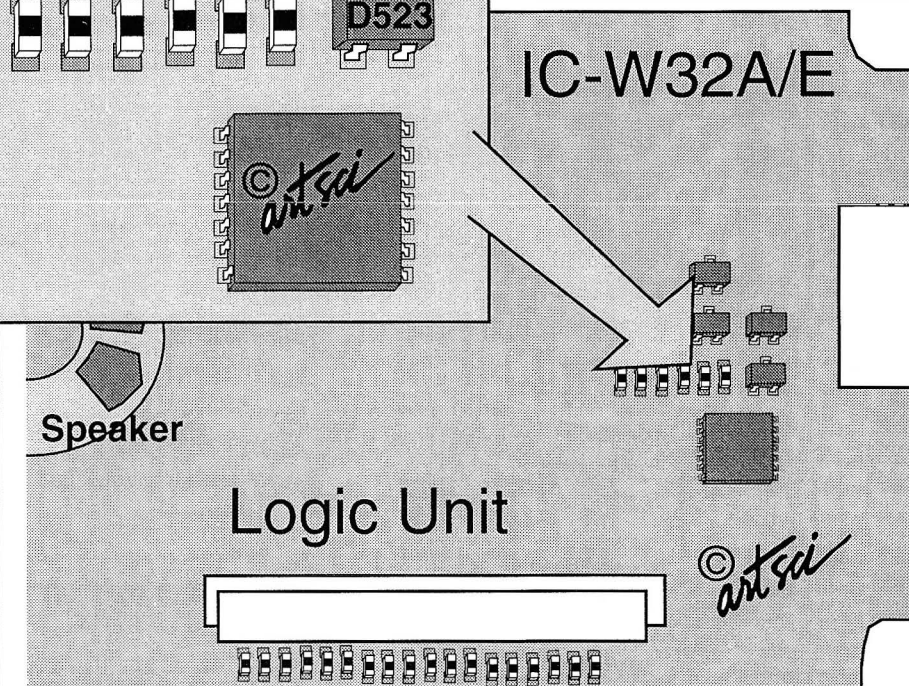
Wx: 1-10 (Weather)

AM Rx: 108-135.995 MHz

* Unlocks above 550 MHz

** Unlocks below 620 MHz (cell band blocked)

*** 136-174 MHz FM is usable



Tech Modifications Volume A

Performance Report

Radio _____

Date _____

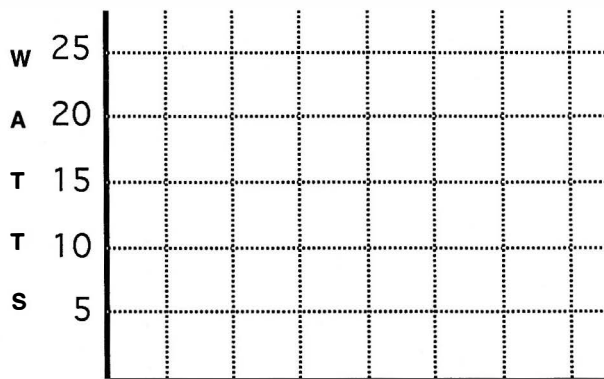
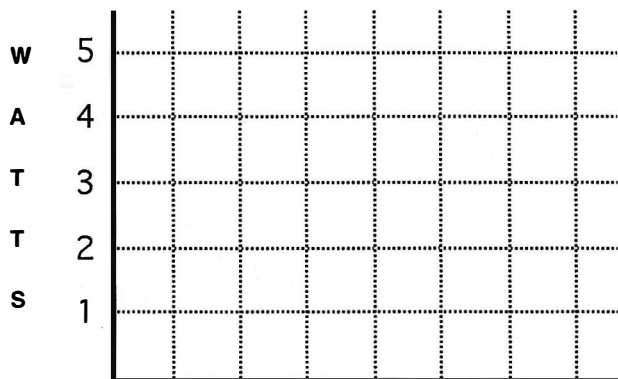
Owner : Name _____

Address _____

City _____ St. _____ Zip _____

Phone () - _____

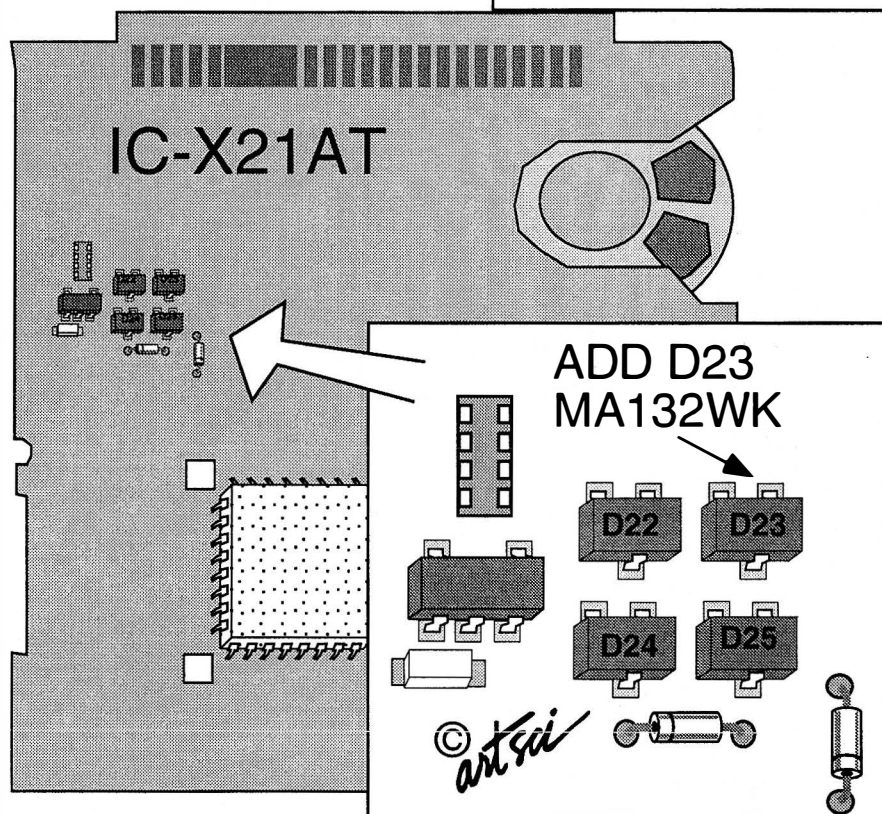
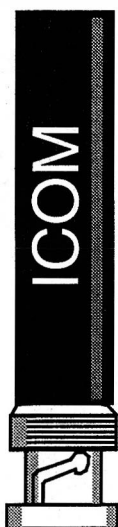
Description	Before	After
Power out (Low)	_____ Watts	_____ Watts
Power out (High)	_____ Watts	_____ Watts
Frequency Error (Simplex)	_____ Hz	_____ Hz
Frequency Error (Offset)	_____ Hz	_____ Hz
Receive Sensitivity (Mid-band)	_____ uv	_____ uv
Receive Sensitivity (____MHz)	_____ uv	_____ uv
Receive Sensitivity (____MHz)	_____ uv	_____ uv
PL Deviation	_____ Hz	_____ Hz
DTMF Deviation	_____ KHz	_____ KHz
Audio Deviation	_____ KHz	_____ KHz
Lowest usable Freq @ .5 Pwr	_____ MHz	_____ MHz
Highest usable Freq @ .5 Pwr	_____ MHz	_____ MHz



Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz.

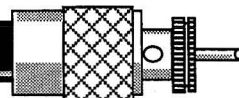
Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Remove battery and antenna.
2. Remove screws from back panel and battery plate and open radio.
3. Locate main logic board.
4. Install Diode D23 in position shown. (D23 is a MA132WK)
5. Reassemble the radio.
6. Reset the microprocessor, if required.

Radio/Tech Modifications Volume A



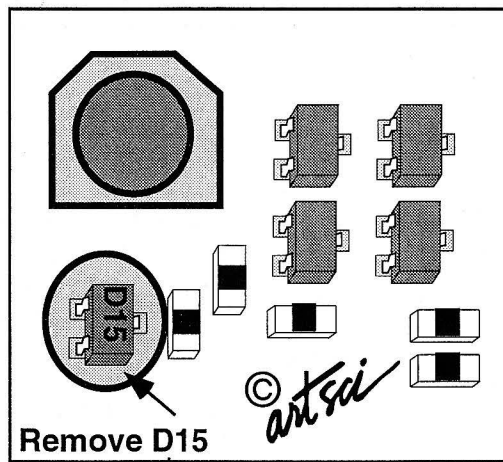
© artsci

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
 Have the original book with you when you call with a question. **Use at your own Risk!**
 The Author and all other parties take no responsibility for any damages or violations
 caused by these modifications. Some modifications may violate FCC rules.
 (818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

Expansion Range

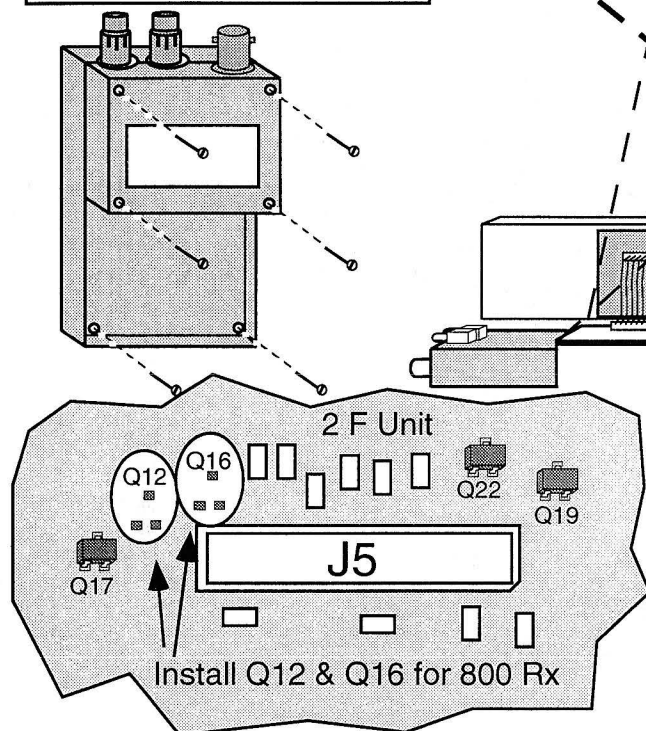
RX: 108 MHz - 172 MHz
300 MHz - 600 MHz
800 MHz - 900 MHz
TX: 138 MHz - 160 MHz
400 MHz - 460 MHz

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Remove D15

© artsci



800 MHz Receive

Install Q12 & Q16 chip components on 2F Unit
(Part # UN9110 order from ICOM
Service Department)
30 kHz Steps

Expanded Transmit Modification

1. Remove battery and antenna.
2. Remove the six screws securing the back from the front case.
3. Locate logic board. (on back side under the keyboard).
4. Locate and **remove** Chip diode D15.
5. Reassemble the radio.
6. Enter Receive expansion keyboard command.

Cross Band Repeater Instructions

Turn on:

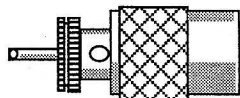
1. Set desired frequencies.
2. Press [FUNC] & [D] & turn radio off
3. Press [MONI] & [RPT] & [#] & turn radio on.
4. An 'L' will appear on the display.

Turn off:

1. Press [MONI] & [RPT] & Turn radio on.

Expanded Receive Mod

1. Press and hold [B] & [#] & turn power on
---- 800 MHz expansion ----
1. Remove knobs, unscrew retainer connected to 2 F Board.
2. Unsolder connector on PTT side and unsolder ground strap.
3. **Install Q12 & Q16** on 2 F Unit
(order from ICOM parts department)
4. Reassemble radio.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

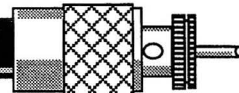
© artsci

ICOM

CPU Resets

- 2GAT** TURN RADIO ON, HOLD [LIGHT] & [FUNCTION], TURN RADIO OFF, TURN ON AND RELEASE BUTTONS.
- 02AT** BELOW SERIAL # 34,000 - PUSH BUTTON ON MAIN BOARD NEXT TO LITHIUM BATTERY.
ABOVE SERIAL # 34,000 - HOLD [FUNCTION] AND TURN RADIO ON.
- 2SA** HOLD [LIGHT] & [MONITOR] AND TURN RADIO ON.
- 2SAT** HOLD [FUNCTION] & [A] AND TURN RADIO ON.
- 2SRA** HOLD [FUNCTION] & [A] & CLR] & TURN RADIO ON.
- u2AT** HOLD [LIGHT] AND TURN RADIO ON.
- 03AT** BELOW SERIAL # 34,000- PUSH BUTTON ON MAIN BOARD NEXT TO LITHIUM BATTERY.
ABOVE SERIAL # 34,000 - HOLD [FUNCTION] AND TURN RADIO ON.
- 3SA** HOLD [LIGHT] & [MONITOR] AND TURN RADIO ON.
- 3SAT** HOLD [FUNCTION] & [A] AND TURN RADIO ON.
- 4GAT** TURN RADIO ON, HOLD [LIGHT] & [FUNCTION], TURN RADIO OFF, TURN ON AND RELEASE BUTTONS.
- 04AT** BELOW SERIAL # 34,000 - PUSH BUTTON ON MAIN BOARD NEXT TO LITHIUM BATTERY.
ABOVE SERIAL # 34,000 - HOLD [FUNCTION] AND TURN RADIO ON.
- 4SA** HOLD [LIGHT] & [MONITOR] AND TURN RADIO ON.
- 4SAT** HOLD [FUNCTION] & [A] AND TURN RADIO ON.
- 4SRA** HOLD [FUNCTION] & [A] & CLR] & TURN RADIO ON.
- u4AT** HOLD [LIGHT] AND TURN RADIO ON.
- 12AT** HOLD [FUNCTION] AND TURN RADIO ON.
- 12GAT** TURN RADIO ON, HOLD [LIGHT] & [FUNCTION], TURN RADIO OFF, TURN ON AND RELEASE BUTTONS.
- 24AT** HOLD [FUNCTION] & [A] AND TURN RADIO ON.
- 27** PUSH RESET BUTTON UNDER TOP COVER
- 28** INSERT A TOOTHPICK INTO HOLE IN THE CORNER OF THE BOTTOM COVER
PRESSING THE RESET BUTTON.
- 32AT** HOLD [FUNCTION] & [A] & [LIGHT] AND TURN POWER ON.
- 37** PUSH RESET BUTTON UNDER TOP COVER.
- 38** INSERT TOOTHPICK INTO HOLE IN THE CORNER OF THE BOTTOM COVER PRESSING THE RESET BUTTON.
- 47** PUSH RESET BUTTON UNDER TOP COVER
- 48** INSERT TOOTHPICK INTO HOLE IN THE CORNER OF THE BOTTOM COVER PRESSING THE RESET BUTTON.

Radio/Tech Modifications Volume A



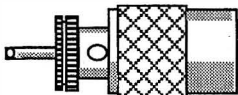
artsci

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations
caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

ICOM

CPU Resets

- 228 HOLD [SQUELCH/MONITOR] & [LOCK] AND TURN RADIO ON.
- 229A HOLD [SET] & [MW] AND TURN RADIO ON.
- 271 REPROGRAM RAM CARD.
- 275 HOLD [M-CL] AND TURN RADIO ON.
- 375 HOLD [M-CL] AND TURN RADIO ON.
- 448 HOLD [SQUELCH/MONITOR] & [CLOCK] AND TURN RADIO ON.
- 471 REPROGRAM RAM CARD.
- 475 HOLD [M-CL] AND TURN RADIO ON.
- 575 HOLD [M-CL] AND TURN RADIO ON.
- 725 HOLD [FUNCTION] & [MW] AND TURN RADIO ON.
- 726 HOLD [FUNCTION] & [MW] AND TURN RADIO ON.
- 761 HOLD [M-CLEAR] AND TURN RADIO ON.
- 765 HOLD [M-CLEAR] AND TURN RADIO ON.
- 781 HOLD [M-CLEAR] AND TURN RADIO ON.
- 900 HOLD [MR] AND TURN POWER OFF AND THEN ON AGAIN.
- 901A TURN RADIO ON, PUCH [CHECK] & [MW]
- 970 HOLD [MW] AND TURN RADIO ON.
- 1200 INSERT TOOTHPICK INTO HOLE IN THE CORNER OF THE BOTTOM COVER PRESSING THE RESET BUTTON.
- 1201 HOLD [SQUELCH/MONITOR] & [LOCK] AND TURN RADIO ON.
- 1220 TURN RADIO OFF FOR A FEW MINUTES AND THEN PRESS SWITCH S1 ON LOGIC BOARD.
- 1271 REPROGRAM RAM CARD.
- 1275 HOLD [M-CL] AND TURN RADIO ON.
- 1520 TURN RADIO OFF FOR A FEW MINUTES AND THEN PRESS SWITCH S1 ON LOGIC BOARD.
- 1600 TURN POWER OFF, WAIT A FEW MINUTES AND TURN POWER ON.
- 2400 HOLD [SUB VOL] AND [MW] AND TURN RADIO ON.
- 2500 HOLD [SUB VOL] AND [MW] AND TURN RADIO ON.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations
caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

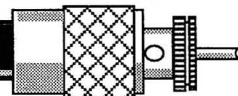
ICOM - 101

ICOM

CPU Resets

- 3200** HOLD [F] BUTTON AND TURN POWER ON.
- 3210** HOLD [SQUELCH/MONITOR] & [LOCK] AND TURN RADIO ON.
- 3220** HOLD [SET] & [MW] AND TURN RADIO ON
- 4020** TURN RADIO OFF FOR A FEW MINUTES AND THEN PRESS SWITCH S1 ON LOGIC BOARD.
- 4520** TURN POWER OFF, WAIT A FEW MINUTES AND TURN POWER ON.
- A2** HOLD [FUNCTION] & [PTT] & TURN POWER ON.
- A20** HOLD [FUNCTION] & CLEAR] & TURN POWER ON.
- A21** HOLD [FUNCTION] & CLEAR] & TURN POWER ON.
- H8** RECLONE OR HOLD [PTT] & [CLONE] & TURN POWER ON.
- H10** RECLONE OR HOLD [PTT] & [CLONE] & TURN POWER ON.
- H16** RECLONE
- H18** RECLONE
- H19** RECLONE
- M5** PUSH BUTTON ON MAIN BOARD NEXT TO LITHIUM BATTERY.
- M7** TURN RADIO ON & HOLD [HI/LOW] & [LOCK] & TURN OFF POWER.
PUSH [CH16D] TO SELECT DIAL MODE.
- M11** TURN ON & HOLD [LIGHT] & [FUNCTION] & TURN OFF POWER & ON AGAIN.
PUSH [CH16D] TO SELECT DIAL MODE.
- M55** REMOVE CLEAR PLASTIC SCREW FROM BOTTOM COVER,
INSERT A TOOTHPICK TO PUSH RESET BUTTON.
- M56** TURN RADIO ON & HOLD [CH16] & [MR] & TURN OFF & TURN ON.
- M80** DISCONNECT LITHIUM BATTERY.
- M100** TURN RADIO ON & HOLD [SQUELCH] KNOB & PRESS RESET.
- M120** TURN RADIO ON & HOLD [CH16] & [USA], TURN RADIO OFF AND BACK ON.
- M500** HOLD [DIMMER] & 13/67] & TURN POWER ON.

Radio/Tech Modifications Volume A

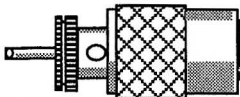


© artsci

ICOM

CPU Resets

- R1** HOLD [FUNCTION] & [CL] & TURN POWER ON.
- R72** HOLD [MW] & TURN POWER ON.
- R100** HOLD [FUNCTION] & [ENT] & TURN POWER ON.
- R9000** HOLD [M-WRITE] AND TURN RADIO ON.
- U8** RECLONE OR HOLD [PTT] & [CLONE] & TURN POWER ON.
- U10** RECLONE OR HOLD [PTT] & [CLONE] & TURN POWER ON.
- U16** RECLONE.
- U18** RECLONE
- U19** RECLONE.
- U200** RECLONE
- U400** RECLONE
- V100** RECLONE
- V200** RECLONE
- W2A** HOLD [FUNCTION] & [A] & [CLR] AND TURN RADIO ON.



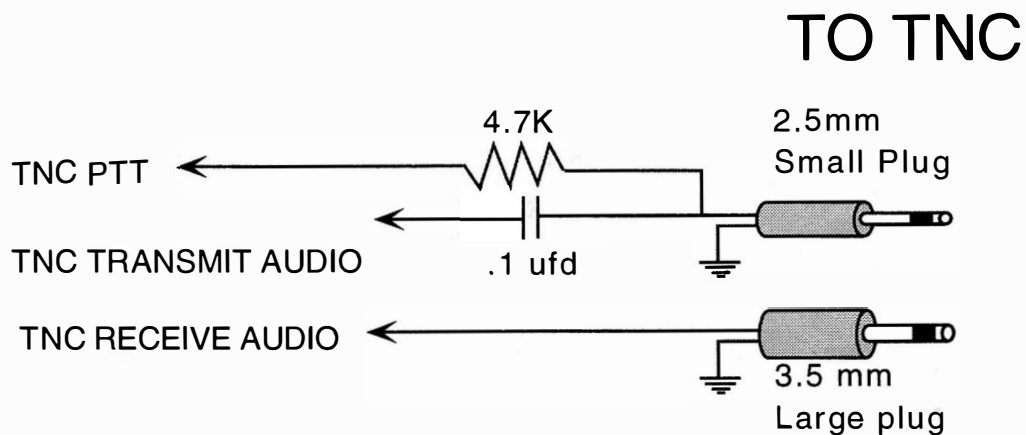
Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations
caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

TNC Hookup

IC-02
IC-03
IC-04
IC-2GAT
IC-4GAT
IC-2SA
ETC.



KENWOOD RADIO MODIFICATIONS

Radio	Modification	Page #
TH-21A	Expanded RF / Alignment Control.....	3
TH-22A	Expanded RF.....	4
TH-25A	Expanded RF / Alignment Control.....	5
TH-26A	Expanded RF / Alignment Control.....	6
TH-27A	Expanded RF / Alignment Control.....	7
TH-28A	Expanded RF / Alignment Control.....	8
TH-31A/BT	Alignment Controls.....	9
TH-41A/BT	Alignment Controls.....	9
TH-42AT	Expanded RF.....	10
TH-45A	Expanded RF / Alignment Control.....	11
TH-48A	Expanded RF / Alignment Control.....	12
TH-55A	Alignment Control.....	13
TH-75A	Expanded RF - Mars/Cap+.....	14
TH-77A	Expanded RF - Mars/Cap+.....	15
TH-78A	Expanded RF / Alignment Control.....	16
TH-79A	Expanded RF.....	18
TH-205	Expanded RF / Alignment Control.....	19
TH-215	Expanded RF / Alignment Control.....	19
TH-225	Expanded RF / Alignment Control.....	19
TH-315	Expanded RF / Alignment Control.....	19
TM-221	Expanded RF / Alignment Control.....	21
TM-231A	Expanded RF / Alignment Control.....	22
TM-241A	Expanded RF / Alignment Control.....	23
TM-251A	Expanded RF.....	24
TM-261A	Expanded RF.....	25
TM-321	Alignment Controls.....	27
TM-331	Expanded RF / Alignment Control.....	28
TM-421	Expanded RF / Alignment Control.....	29
TM-431A	Expanded RF / Alignment Control.....	30
TM-441A	Expanded RF / Alignment Control.....	31
TM-621	Expanded RF / X Repeater/Alignment Controls.....	32
TM-631	Expanded RF / X Repeater/Alignment Controls.....	33
TM-641	Expanded RF.....	41
TM-642	Expanded RF.....	34
TM-701A	Expanded RF/Deviation Controls/X Band Rep.....	35
TM-711	Expanded RF.....	36
TM-721	Expanded RF/Alignment Controls/X Band Rep.....	37
TM-731	Expanded RF/Alignment Controls/X Band Rep.....	38
TM-732	Expanded RF / Alignment Controls.....	39

KENWOOD

KENWOOD RADIO MODIFICATIONS

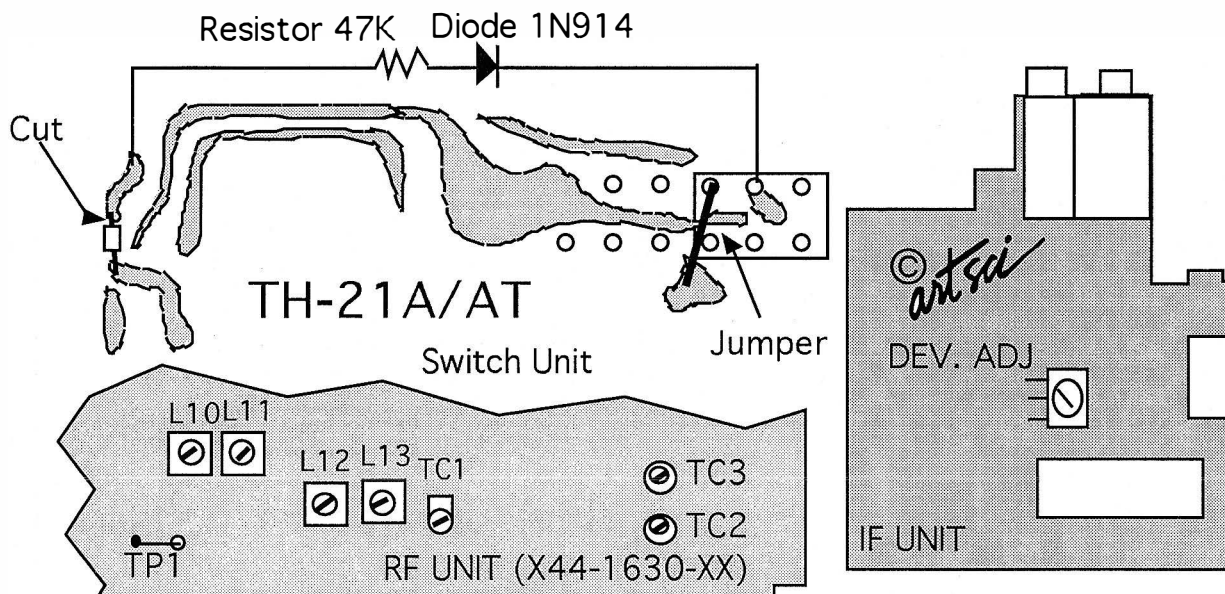
Radio	Modification	Page #
TM-733A	Expanded RF.....	40
TM-741	Expanded RF/X Band Rep.....	41
TM-742	Expanded RF.....	42
TM-941	X Band Rep.....	41
TM-942	Expanded RF.....	42
TM-2530	Expanded RF / Deviation Controls/X Band Rep.....	43
TM-2550	Expanded RF / Deviation Controls/X Band Rep.....	43
TM-2570	Expanded RF / Deviation Controls/X Band Rep.....	43
TM-V7A	Expanded RF - Mars/Cap+.....	44
TR-751	Expanded RF / Deviation Controls.....	47
TR-2500	Expanded RF - Mars/Cap+.....	45
TR-2600	Expanded RF - Mars/Cap+.....	45
TS-50	Expanded RF - Mars/Cap+.....	49
TS-140S	Expanded RF - Mars/Cap+.....	50
TS-430S	Expanded RF - Mars/Cap+.....	51
TS-440S	Expanded RF - Mars/Cap+.....	52
TS-450S	Expanded RF - Mars/Cap+.....	53
TS-680	Expanded RF - Mars/Cap+.....	54
TS-690S	Expanded RF - Expanded RF - Mars/Cap+.....	55
TS-711	Expanded RF - Mars/Cap+.....	56
TS-790A	Expanded RF - Mars/Cap+.....	57
TS-850S	Expanded RF - Mars/Cap+.....	58
TS-870S	Expanded RF - Mars/Cap+.....	60
TS-930S	Expanded RF - Mars/Cap+.....	61
TS-940	Expanded RF - Mars/Cap+.....	62
TS-950SD	Expanded RF - Expanded RF - Mars/Cap+.....	63
TS-2400	Expanded RF - Expanded RF - Mars/Cap+.....	64
TW-4100	Cross Bands Repeater.....	65
TM SERIES	TNC-2 Hookup.....	66

KENWOOD

Expansion Range

140-159 MHz

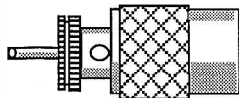
Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Disconnect the battery and antenna.
2. Remove knobs, antenna nut ring and plastic top
3. Remove front panel.
4. Locate switch unit. (PCB X41-1590-00) This unit has the Vol., SQL etc.
5. **Cut trace between R1 and D4, D5**
6. **Install a jumper** from the common point of R11, R5 & 5C to the corner of the tone switch.
7. **Install a 1N914 diode and 48K resistor** from the center top pin of the tone switch to the end of resistor R1. (R1 was cut in step 5).
Note: Cathode end of the diode goes to the tone switch top center pin.
Cathode end of a diode has the line.
8. **Adjust L10, L11, L12, L13, TC1, TC2 & TC3** for maximum upper frequency range.
9. Reassemble the radio.

Depress the tone switch to receive from 140 to 149 MHz
Tone switch off for 150 -159 MHz.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

TH-22AT

Clone Radios

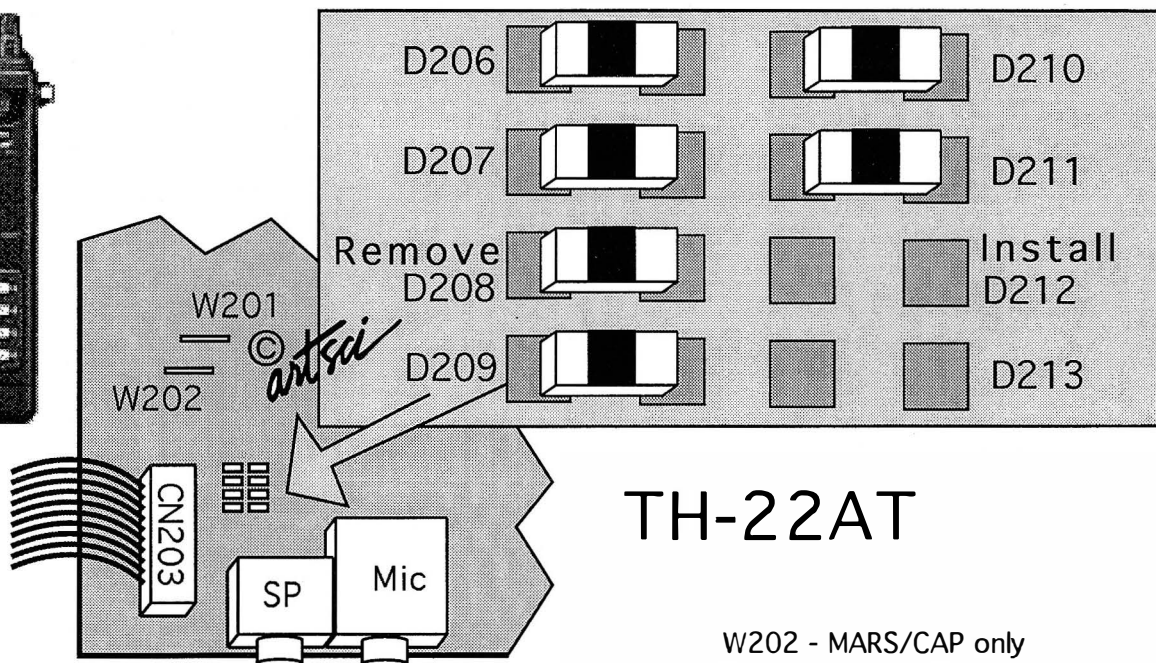
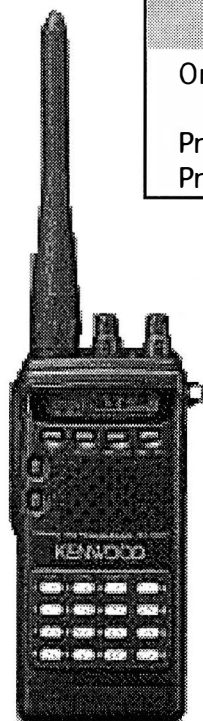
On both master radio and slave

Press and hold [REV] and turn power on
Press PTT on master radio.

Expansion Range

136.000 MHz - 173.995 MHz

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



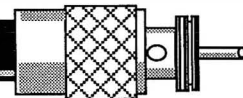
TH-22AT

W202 - MARS/CAP only
W201 - Disable auto offset

Expanded RF Modification

1. Disconnect the battery and antenna.
2. Remove 2 long screws for the rear case.
3. Remove the control knobs from the top of the radio.
4. Remove the rubber top panel.
5. Separate the front and back halves. (Squeeze the bottom front panel)
6. Locate and **remove Diode D-208**. (Located on the front panel circuit board)
7. **Install the diode** into location D-212.
(Diodes D-210, D-211 & D-212 face the same direction)
8. Reassemble the radio
9. Reset the microprocessor (Press and hold [F] and turn power on)

Radio/Tech Modifications Volume A



©artsci

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

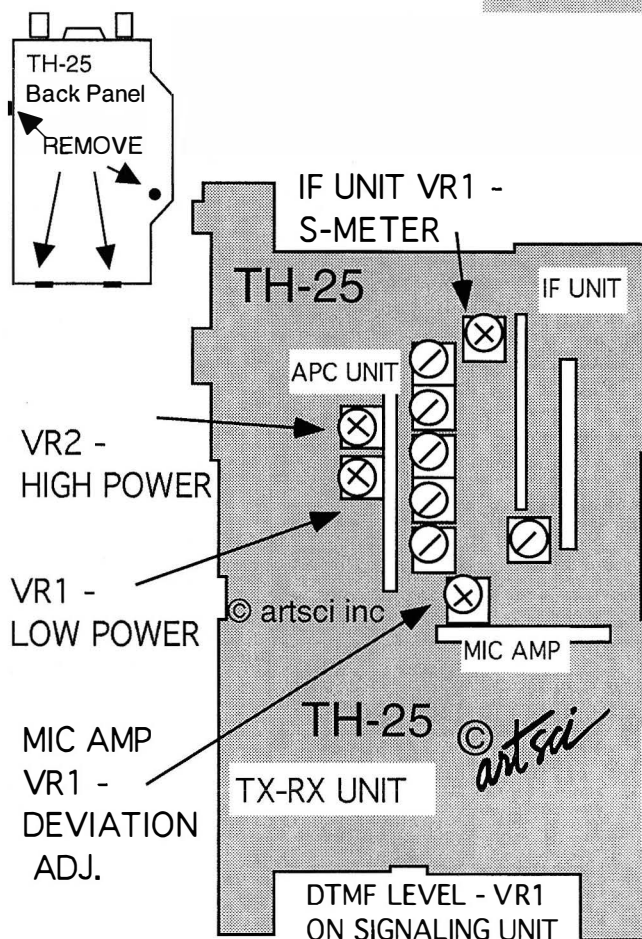
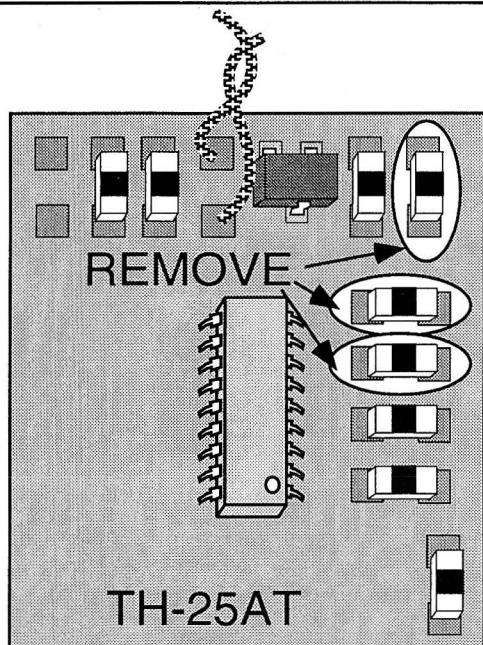
Receive and Transmit Expansion

KENWOOD
TH-25AT

Expansion Range

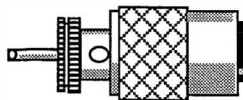
141 Mhz - 163 Mhz

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Disconnect the power and antenna.
2. Remove the volume, squelch and tuning control knobs
3. Remove the nuts from the volume control and tuning controls.
4. Remove screw located by the PTT switch.
5. Remove screw by the speaker jack
6. Remove two screws from the battery plate.
7. Carefully pull the front panel from the radio. Do not break any wires.
8. Gently lift the top panel from the radio by pulling it forward and then upwards.
The O ring on the BNC connector will cause some tension.
9. Rotate the top panel towards the front of the radio to expose the .75" X .75" board.
10. **Remove chip resistors R19, R20 & R21.**
11. Reassemble the radio.
12. **RESET the CPU.** (Hold down [M] and turn power on.)



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

Kenwood - 5

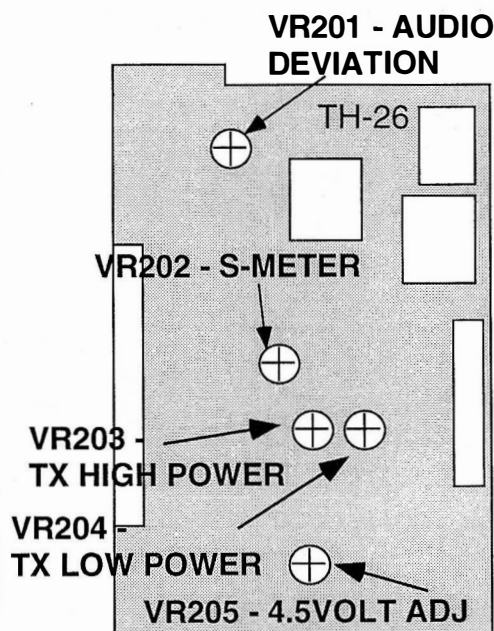
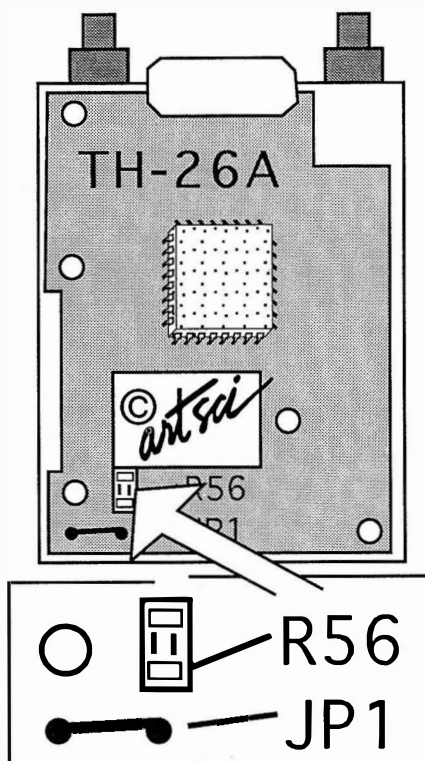
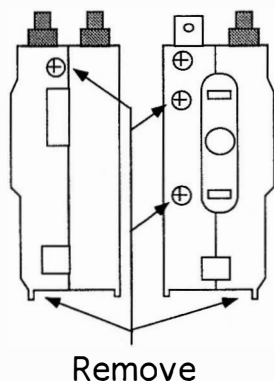
KENWOOD



Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz .

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

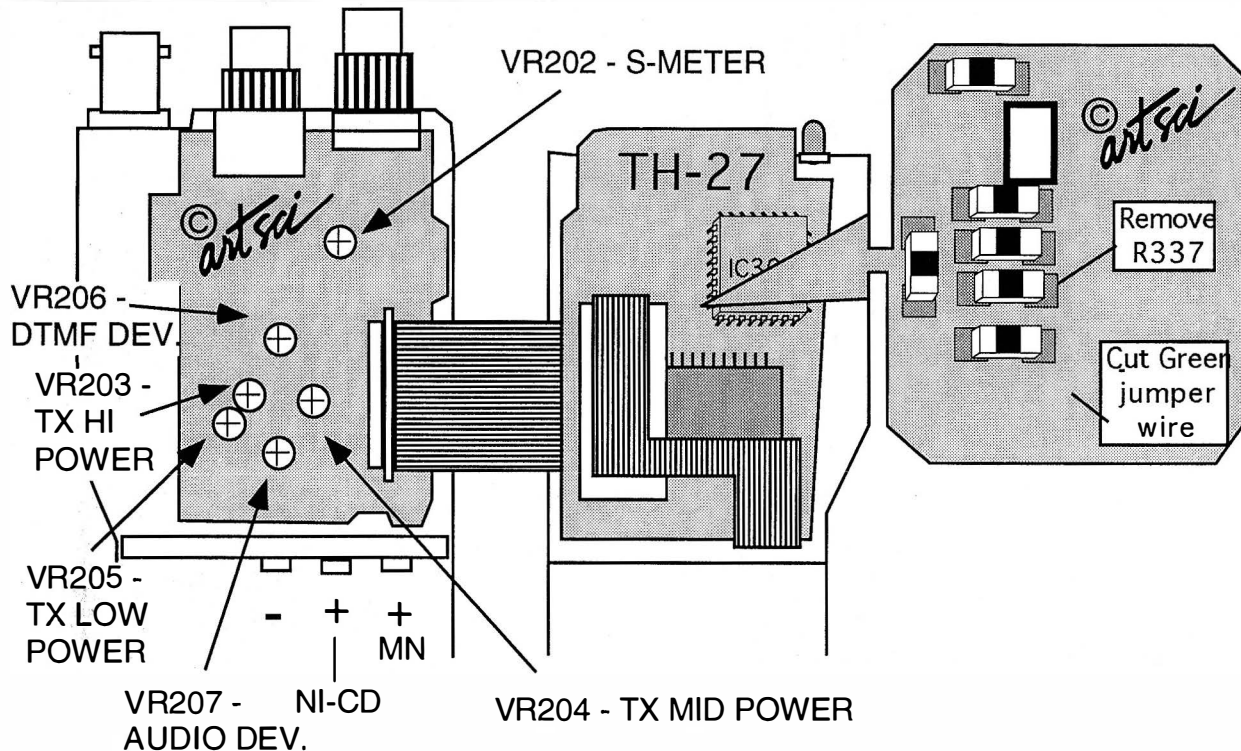
1. Disconnect the power and antenna.
2. Remove 3 screws from the case and 2 from the battery plate.
3. Open the radio.
4. **Remove jumper JP1.** Use a soldering iron the remove the jumper. Do not pull the jumper or overheat the board.
5. Unsolder and **remove chip resistor R56.**
6. Reassemble the radio. Carefully re-seat the O-Ring on the BNC connector.
7. **Reset the microprocessor.** (Press and hold the [F] key and turn the power on.)

Note: Automatic offset selection will be disabled when this mod is performed.

Expansion Range

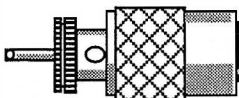
The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz .

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Disconnect the Power and antenna.
2. Remove 4 screws from the back panel.
3. Open the bottom of the front panel first and slide the panel downward.
4. Open the radio being careful not to break the flex cable.
5. Move the tone board out of the way to expose the green jumper wire located inside the front panel assembly.
6. **Cut the GREEN Jumper wire.**
7. **Remove chip resistor R337.** (Disables AM receive & auto offset)
8. Reassemble the radio. Carefully re-seat the O-Ring on the BNC connector.
9. Reset the Microprocessor. (Press and hold the [M] key and turn the power on.)



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

Kenwood - 7

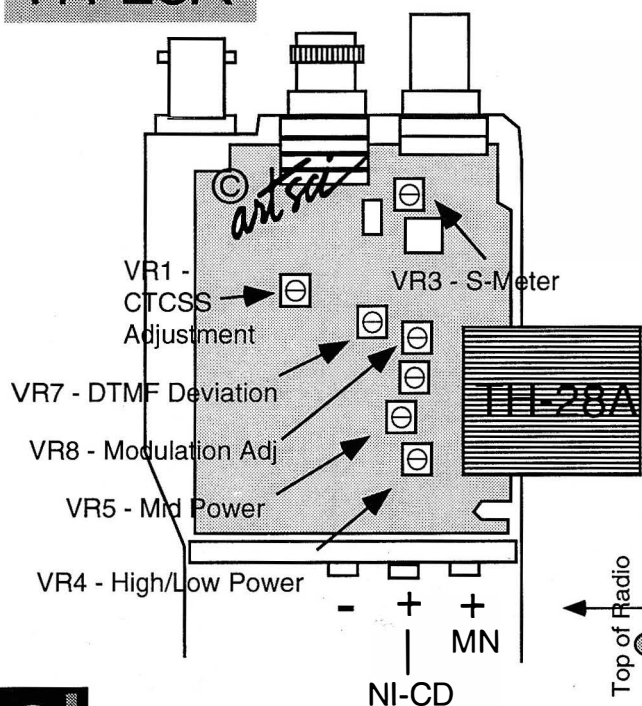
KENWOOD

Kenwood TH-28A

Receive and Transmit Expansion

Expansion Range

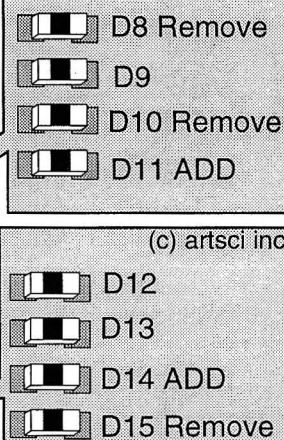
The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz. Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Unscrew

Unsolder shield. Replace when completed

TH-28/48A



(c) artsci inc.

W1 & W2 only on later versions

Auto offset is disabled

Expansion to 179.995 (some units)

1. Dial 169.995 MHz in VFO
2. Press [7].
3. Press [VFO]
Display should show 179.995
4. Press & hold [M] for longer than 1 second
5. Press [4] (selects upper VFO range)

Expanded RF Modification

1. Disconnect the Battery and antenna.
 2. Remove 4 back case screws and open the radio.
- THERE ARE 2 VERSIONS OF THIS RADIO.** The later one has 2 green jumper wires. Some users report full expansion requires performing all steps below.
- Some users should not Cut jumper W2.**
3. Cut W2 jumper only and go to step 9 below.
 4. Locate & Unsolder the two solder tack point on the shield.
 5. Remove the two screws holding the shield.
 6. Locate chip diode positions D8.....D15. (part # MA110 or 1SS355)
 7. **Remove Diode D8, D10 & D15.** (save the diodes)
 8. **Install Diodes D11 & D14.** (used diodes removed in the previous step)
 9. Reassemble the radio.
 10. **Reset the microprocessor.** (Press and hold [M] and turn power on)

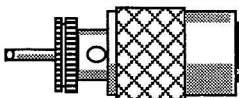
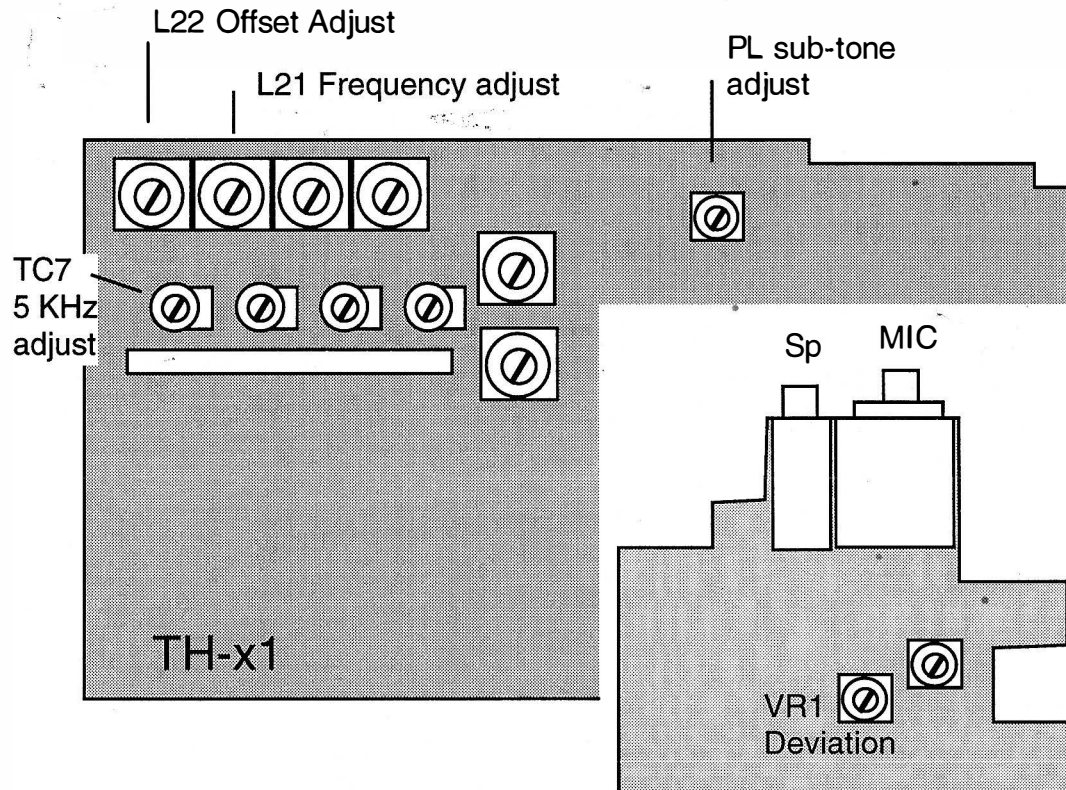
Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com



Radio/Tech Modifications Volume A

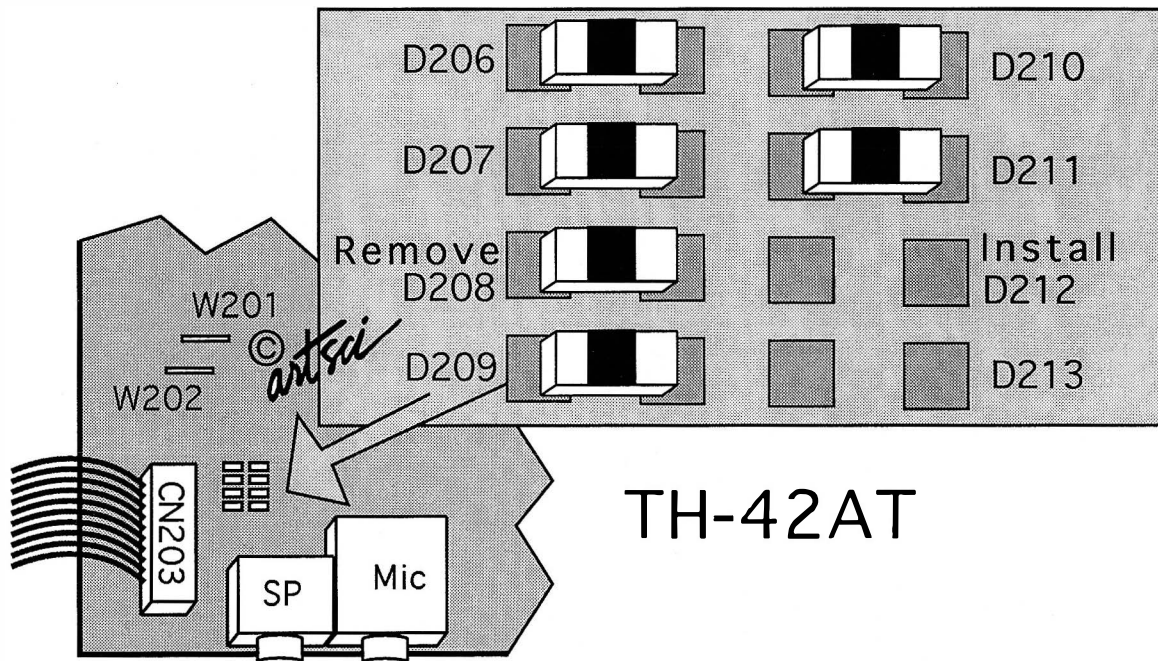
Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations
caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 420 - 469 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



TH-42AT

Expanded RF Modification

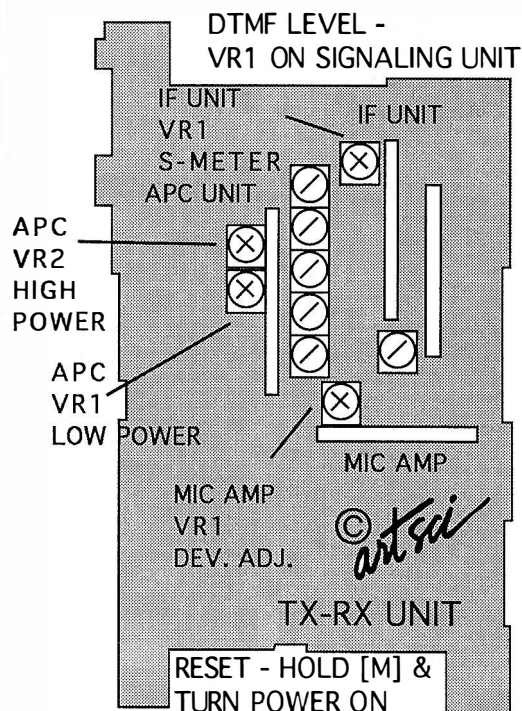
1. Disconnect the battery and antenna.
2. Remove 2 long screws for the rear case.
3. Remove the control knobs from the top of the radio.
4. Remove the rubber top panel.
5. Separate the front and back halves. (Squeeze the bottom front panel)
6. Locate and remove Diode D-208. (Located on the front panel circuit board)
7. Install the diode into location D-212.
(Diodes D-210, D-211 & D-212 face the same direction)
8. Reassemble the radio
9. Reset the microprocessor (see owners manual)

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 420 - 469 Mhz.

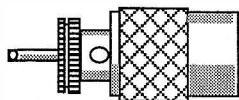
Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

See TH-25 Picture



Expanded RF Modification

1. Disconnect the power and antenna.
2. Remove the volume, squelch and tuning control knobs
3. Remove the nuts from the volume control and tuning controls.
4. Remove screw located by the PTT switch.
5. Remove screw by the speaker jack
6. Remove two screws from the battery plate.
7. Carefully pull the front panel from the radio. Do not break any wires.
8. Gently lift the top panel from the radio by pulling it forward and then upwards.
The O ring on the BNC connector will cause some tension.
9. Rotate the top panel towards the front of the radio to expose the .75" X .75" board.
10. **Remove chip resistors R18 & R28.**
11. Reassemble the radio.
12. **RESET the CPU.** (Hold down [M] and turn power on.)

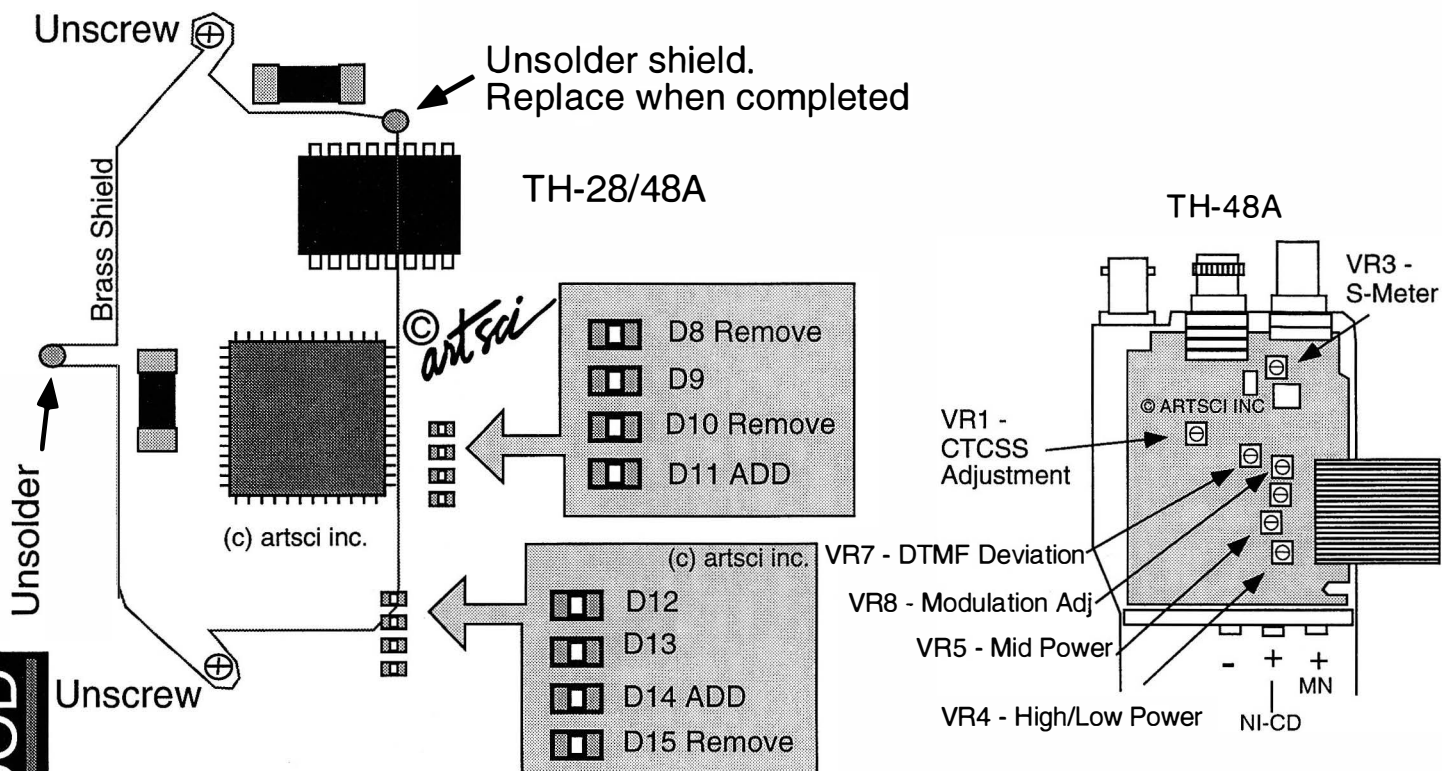


Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci





Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 420 - 469 Mhz.

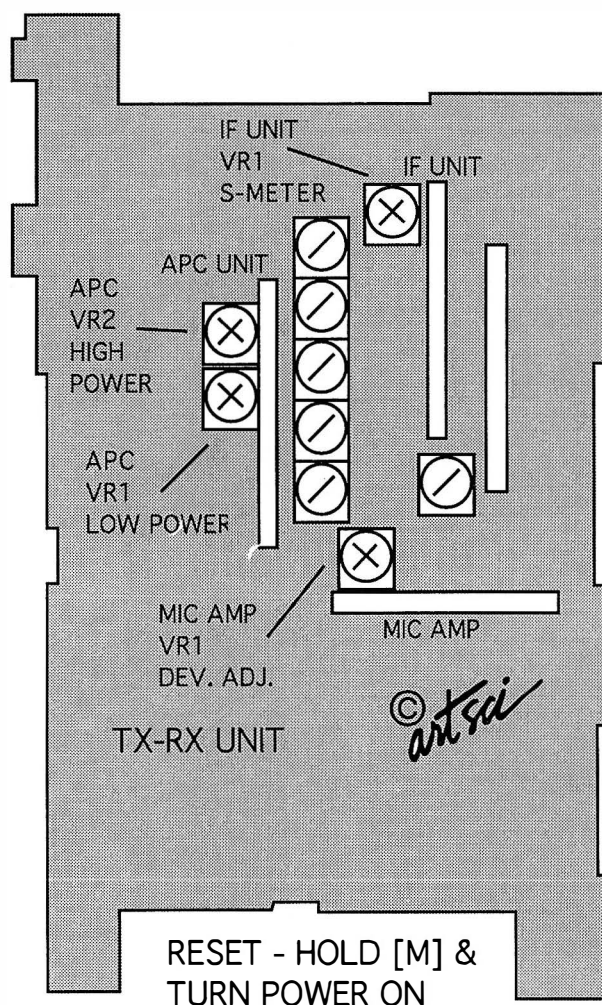
Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

Expanded RF Modification

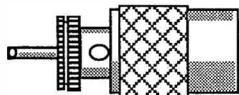
1. Disconnect the Power and antenna.
2. Remove case screws and open the radio.
3. Locate Brass Shield.
4. Unsolder the two solder tack point on the shield.
5. Remove the two screws holding the shield.
6. Locate chip diode positions D8.....D15.
7. **Remove Diode D8, D10 & D15.** (save the diodes)
8. **Install Diodes D11 & D14.** (used diodes removed in the previous step)
9. Replace the brass shield. (replace the screws and the solder tack points.
10. Reassemble the radio.
11. **Reset the microprocessor.** (PRESS AND HOLD [F] AND TURN POWER ON)

Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
 Have the original book with you when you call with a question. **Use at your own Risk!**
 The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
 (818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com



DTMF LEVEL -
VR1 ON SIGNALING UNIT



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations
caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

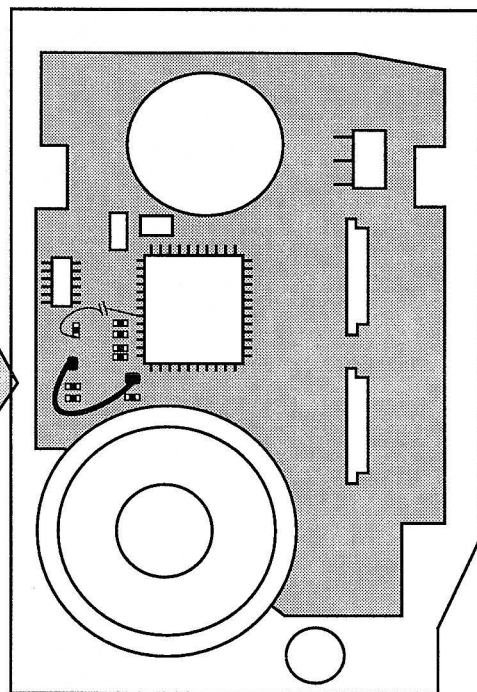
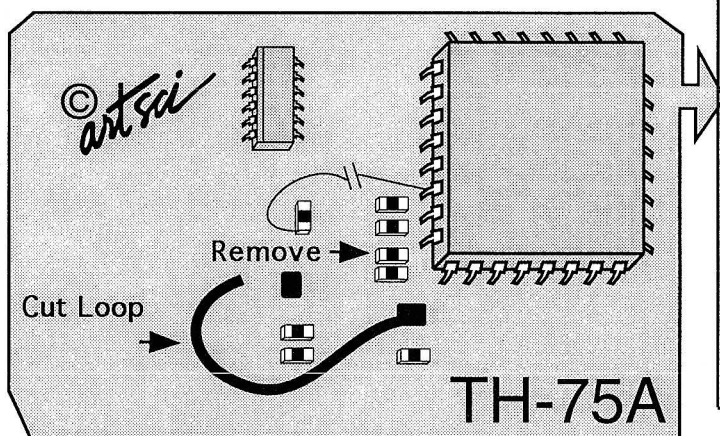
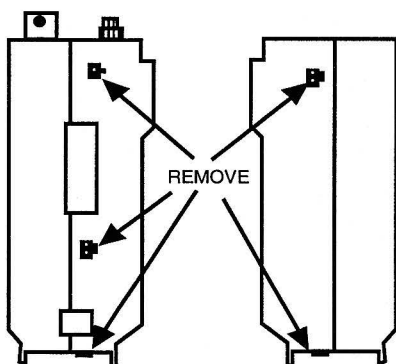
Kenwood TH-75A

Receive and Transmit Expansion

Expansion Range

The Exact range of this radio is not known as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



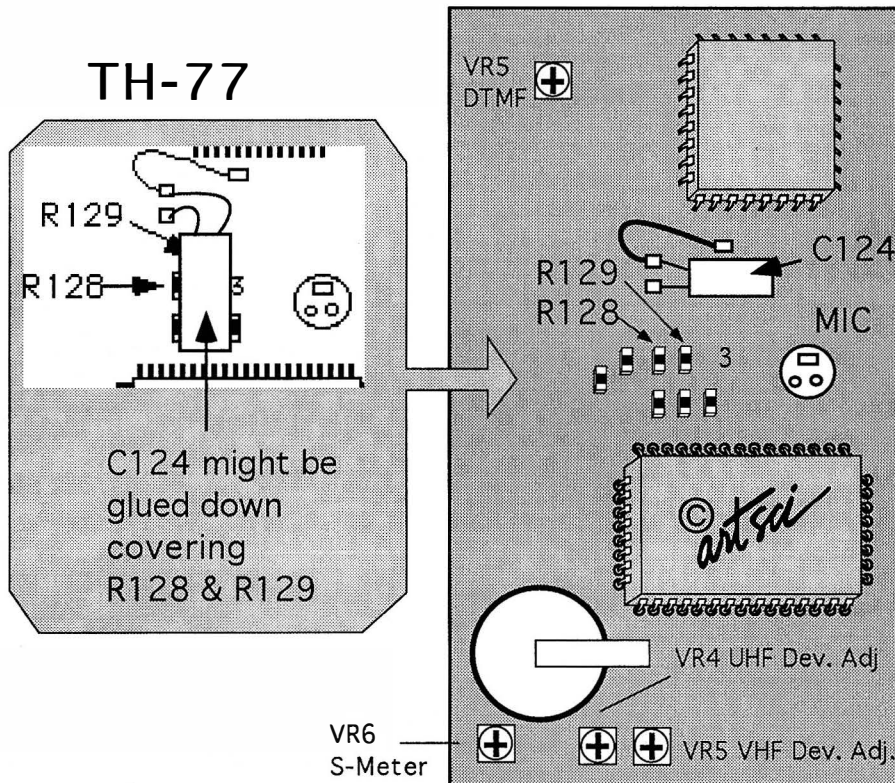
Expanded RF Modification

1. Disconnect the battery and antenna.
2. Remove the three case screws and two battery plate screws.
3. Lift front panel from radio. Do not disconnect flex cables.
4. **Cut the GREEN JUMPER WIRE**, located on left side of the CPU.
5. **Remove the diode.** (see drawing)
6. Reassemble the radio.
7. **RESET the CPU.** (Press and hold the M Key while turning on the radio.)

Radio/Tech Modifications Volume A

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 118 Mhz - 165 Mhz. AM sensitivity is typically less than 1uV for 10db S+N/N. Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

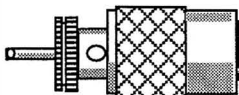


Expanded RF Modification

1. Disconnect the battery and antenna.
2. Remove the three case screws and two battery plate screws.
3. Lift front panel from radio. Do not disconnect flex cables.
4. **Remove chip resistor R128 and R129.** Capacitor C124 may be glued down over these Resistors. You may wish to unsolder the capacitor to avoid tearing the flex board foil traces.
5. Reassemble the radio.
6. RESET the CPU.

Crossband Repeater Instructions

Turn on /off: Press and hold the [SUB UP] key and turn the power on.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci



Kenwood

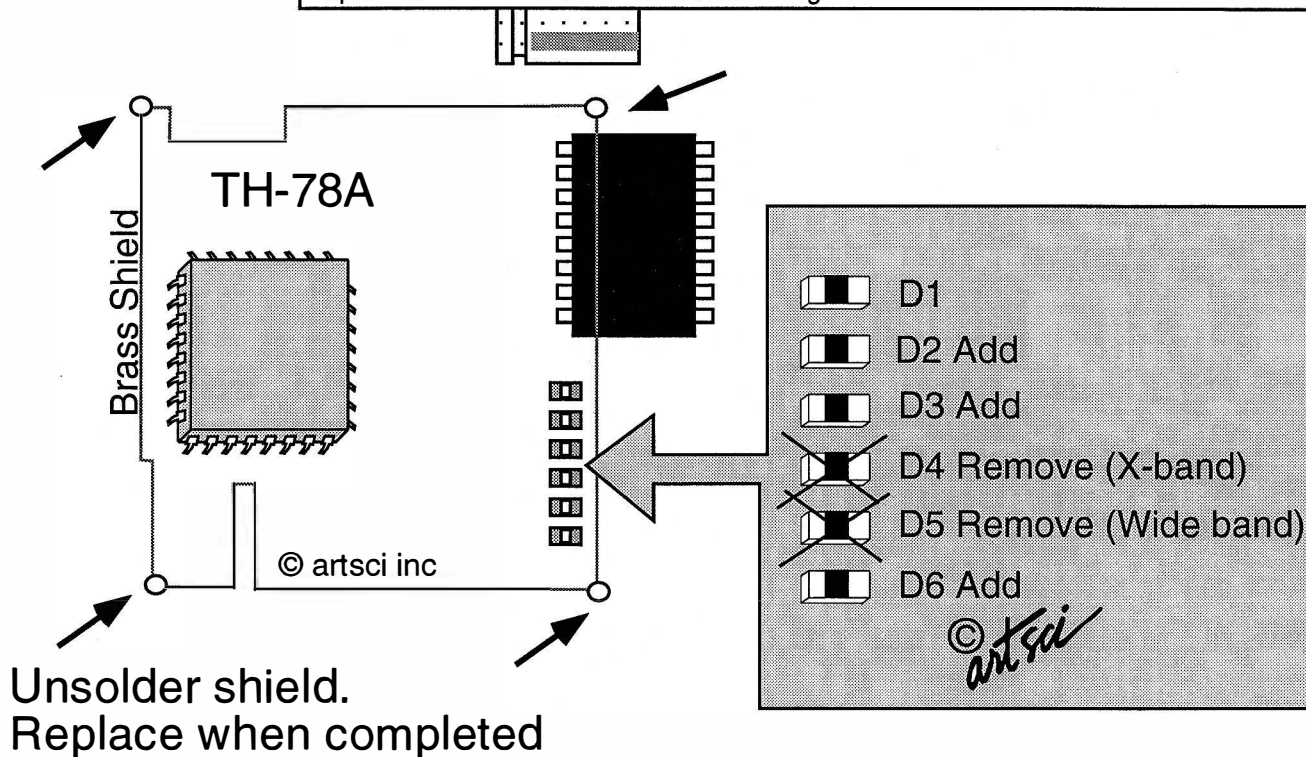
TH-78A Early Model

Receive and Transmit Expansion

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Disconnect the battery and antenna.
2. Remove 4 screws (3 on back & 1 on left side) and open the case.
3. Locate and remove the Brass Shield. (4 solder points)
4. Locate Diode position D1.....D6. (part # MA110 or 1SS355)
5. **Install a chip diode** in position D2, D3 & D6. (Present in USA versions)
6. **Remove chip diode D5.** (Expanded RF)
7. **Remove chip diode D4.** (Cross band mod)
8. Reassemble the radio. (Be careful of the small O-rings sealing the two LED's)
9. Reset the Microprocessor. (see user manual).

Other Commands

TO TURN ON/OFF CROSS BAND REPEATER: PRESS [F] & [0].

TO CLONE RADIOS: Press & hold [F] [0] [Power] for 2 seconds. Press PTT on master radio

NOTE: TO SELECT 300 & 800 MHz. IN 440: PRESS [F] KEY FOR 2 SECONDS THEN [BAND].

Radio's with Serial Numbers starting with a "6" have no 800 MHz RX.

Radio/Tech Modifications Volume A

Kenwood - 16

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

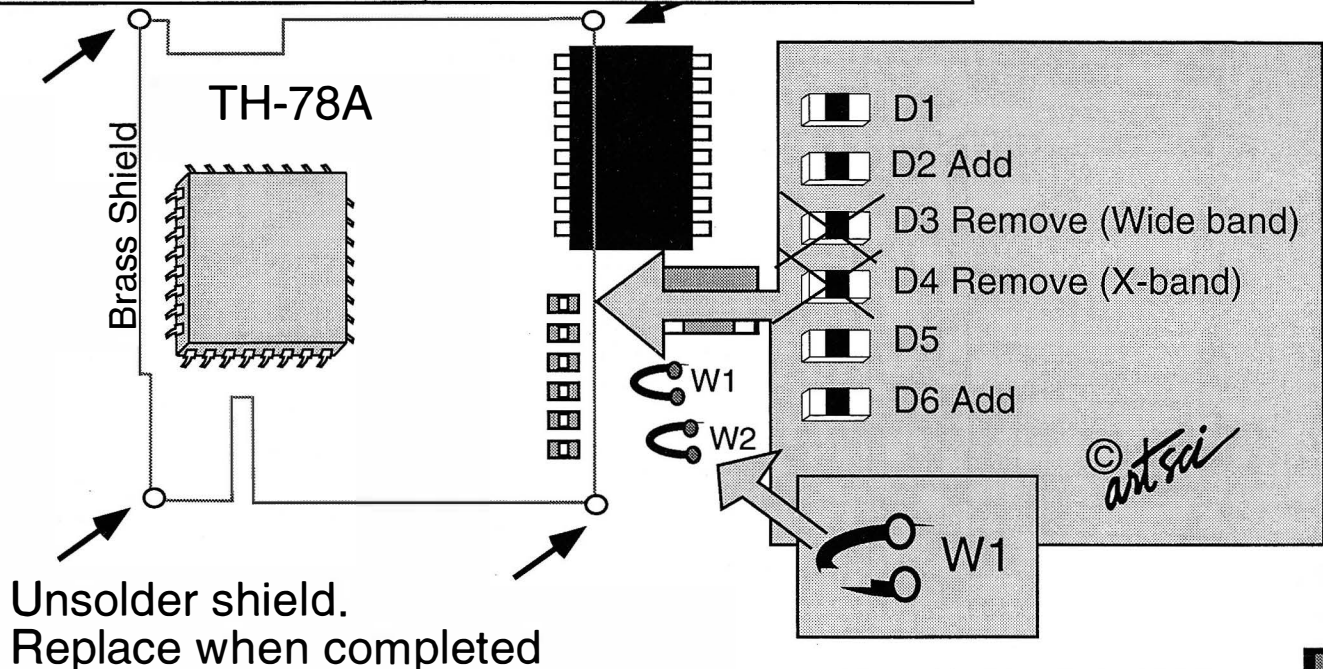
Receive and Transmit Expansion

KENWOOD
TH-78A
Later Model
Green Wire

Expansion Range

136 Mhz - 174 Mhz & 420 - 490 Mhz.

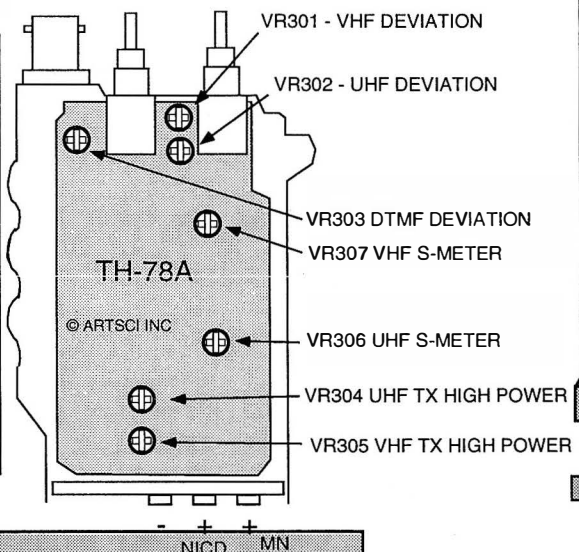
Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Unsolder shield.
Replace when completed

Expanded RF Modification

1. Disconnect the battery and antenna.
2. Remove 4 screws (3 on back & 1 on left side) and open the case.
3. Locate and remove the Brass Shield. (4 solder points)
4. Locate Diode position D1.....D6. (part # MA110 or 1SS355)
5. **Locate and cut W1.**
6. **Remove chip diode D3.** (Expanded RF)
7. **Remove chip diode D4.** (Cross band mod)
8. Reassemble the radio.
(Be careful of the small O-rings sealing the two LED's)
9. **Reset the Microprocessor.**
(Press & hold [M] key & turn on, Hold [M] until LCD clears).



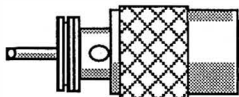
Other Commands

TO TURN ON/OFF CROSS BAND REPEATER: PRESS [F] & [0].

TO CLONE RADIOS: Press & hold [F] [0] [Power] for 2 seconds. Press PTT on master radio

NOTE: TO SELECT 300 & 800 MHz. IN 440: PRESS [F] KEY FOR 2 SECONDS THEN [BAND].

Radio's with Serial Numbers starting with a "6" have no 800 MHz RX.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

Kenwood - 17

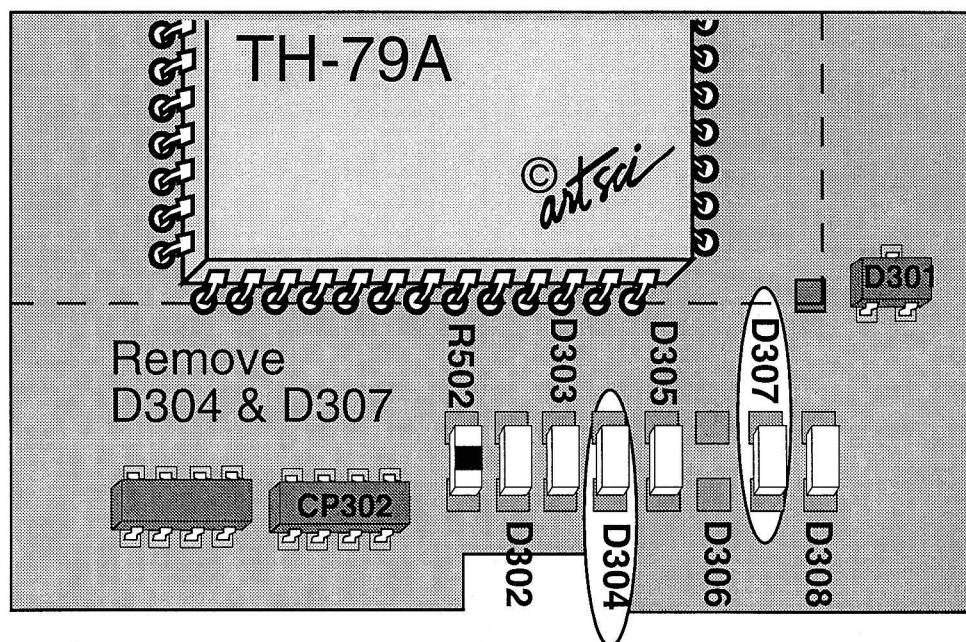
Kenwood TH-79A

Receive and Transmit Expansion

Expansion Range

Receive: 67 MHz - 173.995 MHz
400 MHz - 469 MHz
Transmit: 136 MHz - 173.995 MHz
400MHz - 469 MHz

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Disconnect the battery and antenna.
2. Remove three screws from the back of the radio.
3. Remove one screw from the side under the Speaker/Mic/Power jacks rubber cover.
4. Remove the CTCSS access cover.
5. Squeeze the bottom side panel where the battery inserts to release the locking hooks.
6. Separate the two halves of the radio.
7. **Locate and remove Diodes D304 & D307** (located on the back of the front panel).
8. Reassemble the radio.
9. Reset the microprocessor (Press and hold [F] & Turn Power on, then press [F])

Note Jumper W301 is for MARS/CAP expansion only.
300 Band access - Press [F] & [Hi/LOW/EL]
See new menu options # 19 & 20

Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

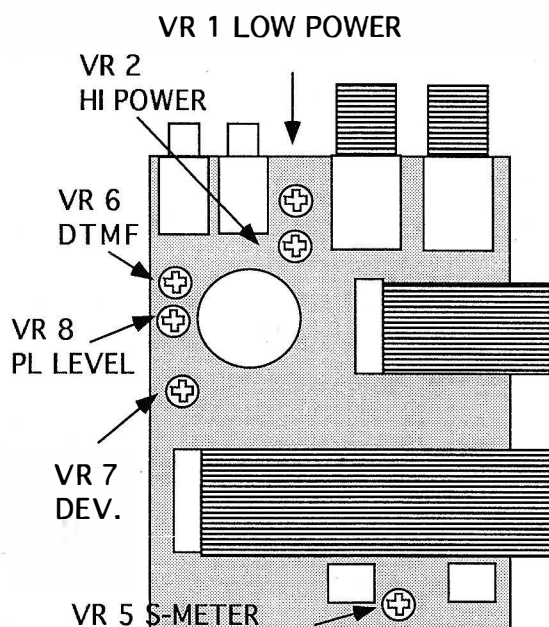
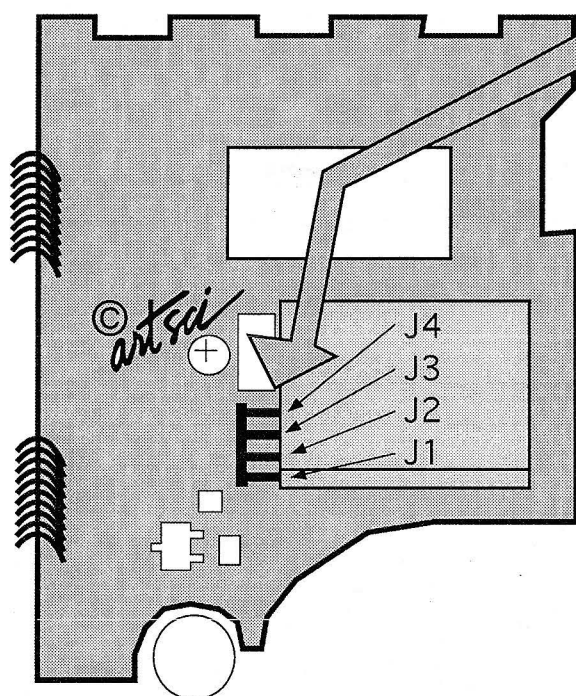
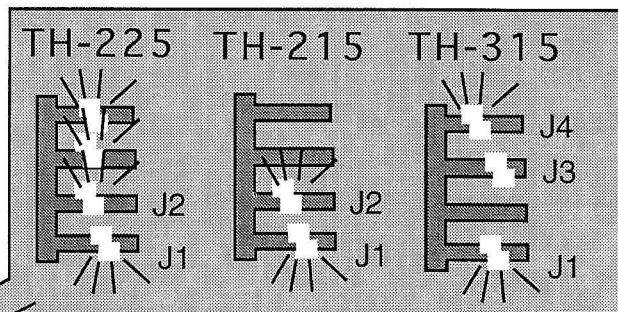
TH-215
TH-225
TH-315

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz.

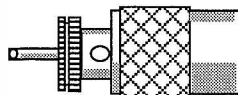
315 Range: 215 MHz - 230 MHz

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Disconnect the power and antenna.
2. Remove the 4 screws from the back panel.
3. Carefully lift the front panel from the radio. Do not disconnect the flex cables.
4. **CUT Jumpers shown below.** Select your radio.
5. Reassemble the radio.
6. **RESET the CPU.** (Press and hold [F] & [ENTER] and turn power on)



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci



Radio/Tech Modifications

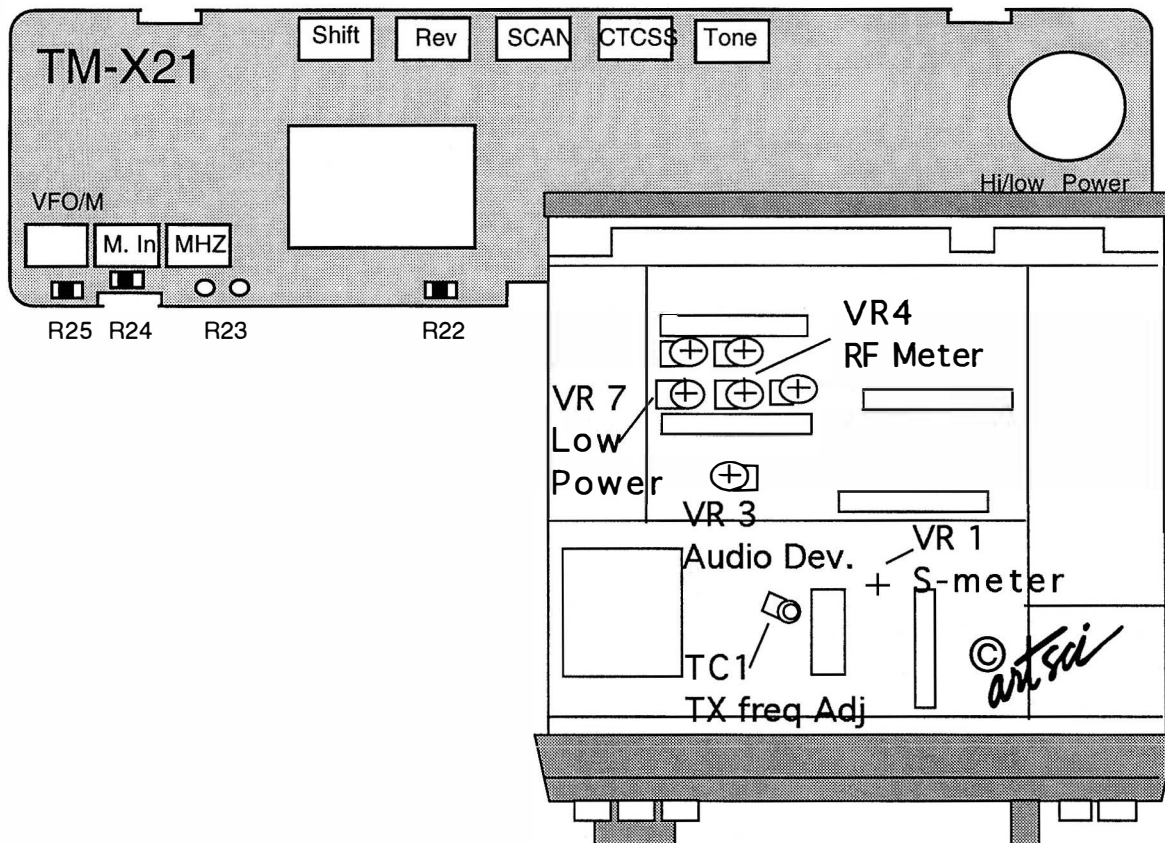
Frequency report

[illegible]

Expansion Range

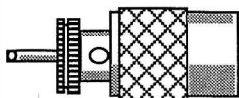
142 MHz - 154 MHz

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Disconnect the power and antenna.
2. Remove the top and bottom covers.
3. Locate the control unit (X53-3040-XX). It is the board closest to the front.
4. **Remove R25** and place it in the position of R24.
5. Reassemble the radio.
6. **RESET the CPU.** (Press and hold [VFO/M] & [M.IN] and turn power on)



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

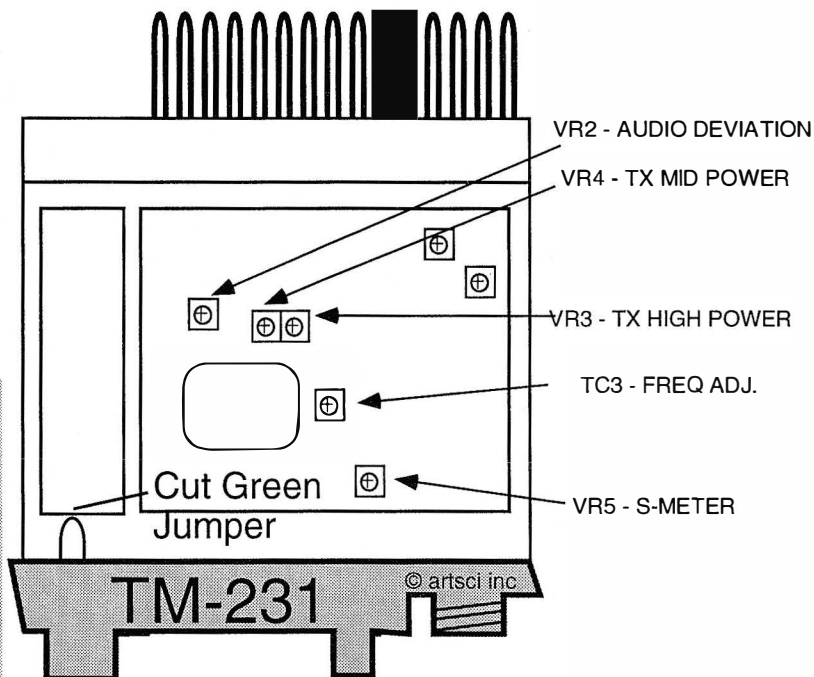
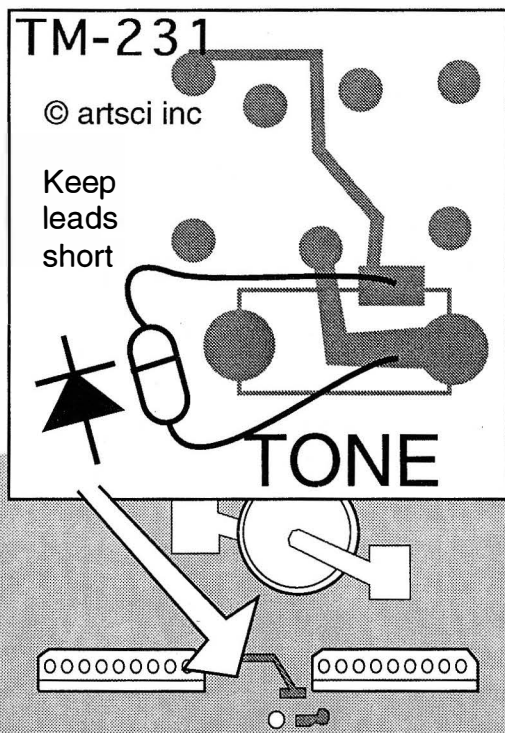
© artsci



Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

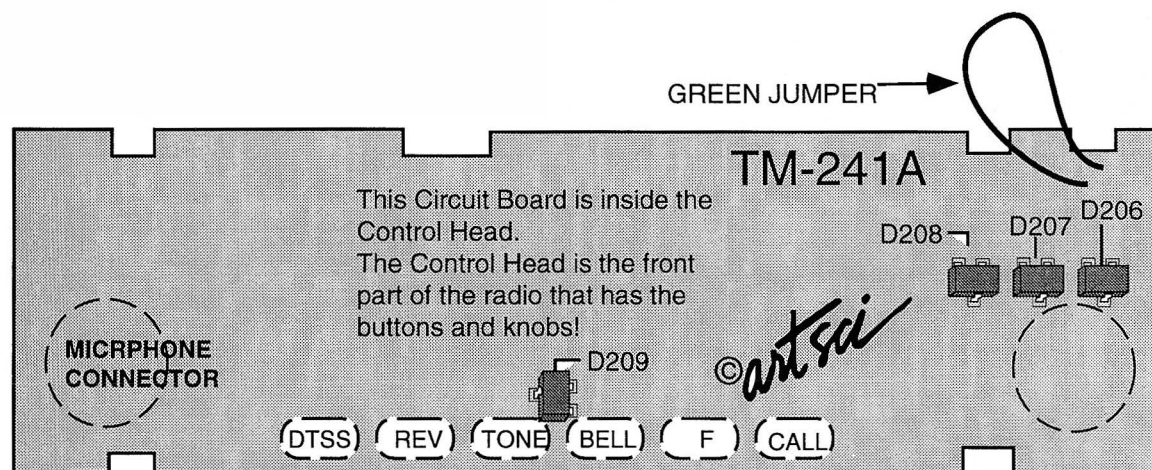
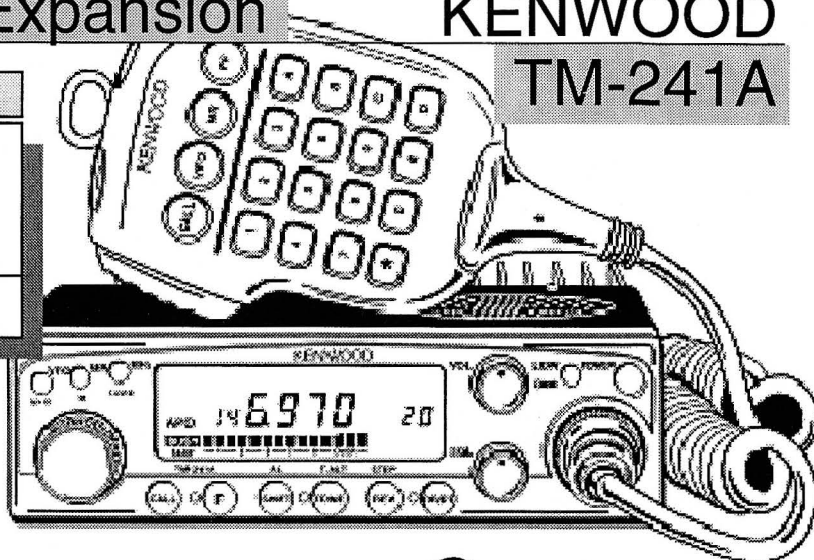
1. Disconnect the power and antenna.
2. Remove the top and bottom cover.
3. Remove all knobs from the front panel.
4. Remove the nut from the mic jack and the nut from the channel switch.
5. Remove four screws holding the front panel.
6. Remove the three screws from the control board.
7. Locate the green jumper wire sticking out the front panel, behind the VFO button
8. **Cut the green jumper** and tape the edges to prevent them from shorting.
9. **Install diode D209** Part # MA141A on control board X57-3310-11.
10. Reassemble the radio
11. Reset the microprocessor. (Press and hold [MR] while turning on the power)

Receive and Transmit Expansion

KENWOOD
TM-241A

Serial Numbers	MARS/CAP	EXPANDED RF
508XXXX	YES	NO
509 XXXX	YES	NO
510XXXX	YES	NO
511XXXX	YES	NO
512XXXX	YES	YES

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz .

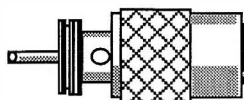


Expanded RF Modification

1. Turn power off.
 2. Remove top and bottoms covers.
 3. Remove the locking nut from the microphone jack and the channel selector.
 4. Remove 4 screws that secure the front panel to the body of the radio.
 5. Gently pull the front panel away from the chassis and locate the Control unit.
 6. Remove 3 screws that secure the Control unit and pull the board away from the chassis.
 7. Locate the three diodes as shown above on the circuit board.
 8. **Remove all three diodes.** (not all may be installed) D208, D207 & D206
 9. Reassemble the radio.
 10. Reset the microprocessor. (Hold [MR] and turn power on)
- SOME MODELS ONLY REQUIRE **Install chip Diode D209**

MARS/CAP Modification

Range expanded from 142 - 151 MHz
Cut Green Jumper.
Tape end to prevent shorts.



Radio/Tech Modifications Volume A

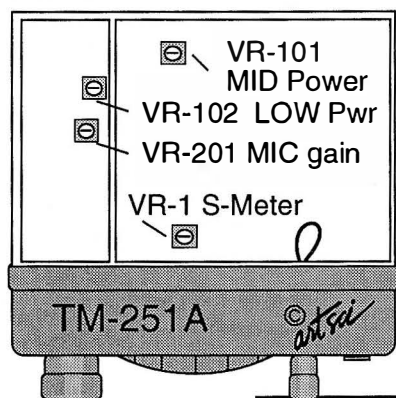
Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

Kenwood - 23



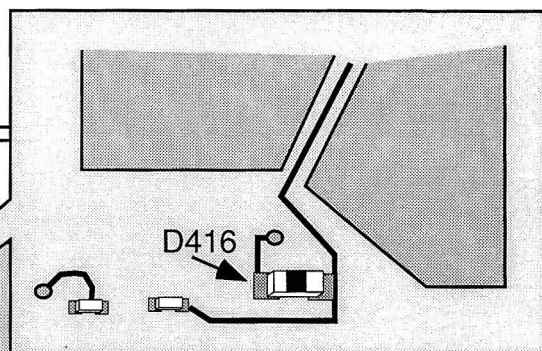
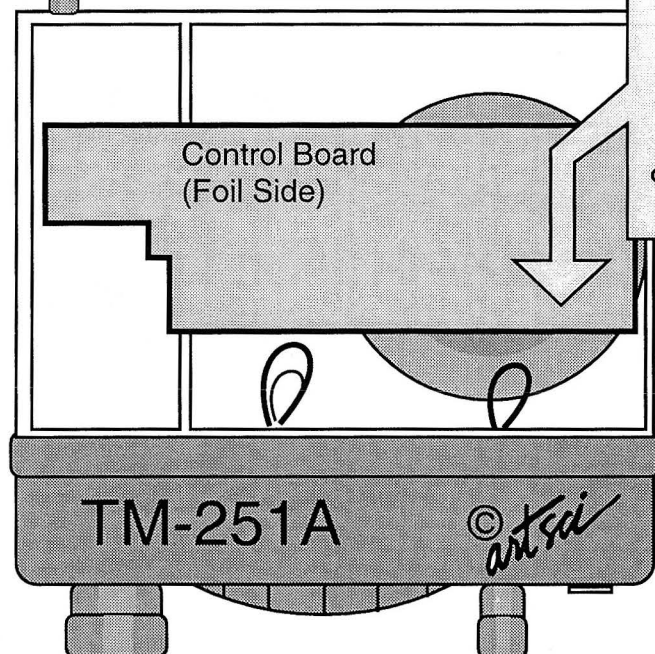
TM-251A



Expansion Range

136.000 MHz - 173.995 MHz

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



You will lose the Automatic offset

Expanded RF Modification

REF: K.S.I. 02094

1. Disconnect the power and antenna.
2. Remove the top and bottom covers.
3. Remove front panel knobs, VOL, SQL & Main tuning.
4. Remove Nut & washer from Tuning knob.
5. Gently remove plastic front panel.
6. Remove 4 phillip head screws on the front panel and pull panel away from body.
7. Remove two phillip screws holding the Control Unit in place & pull away from main unit.
8. **Remove Diode D416.**
9. Reassemble the radio.
10. Reset Microprocessor (Press and hold [MR] & turn power on)

Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

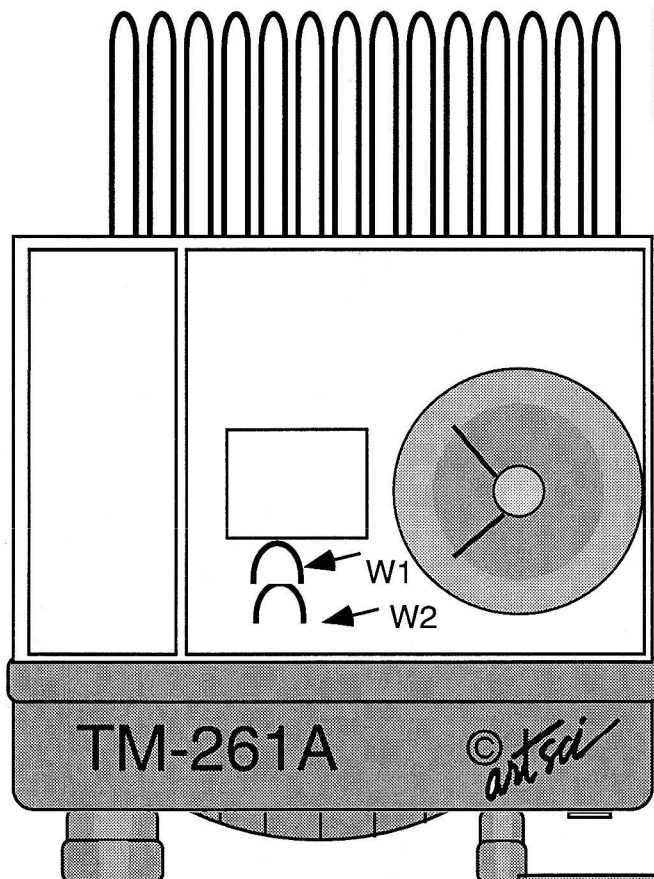
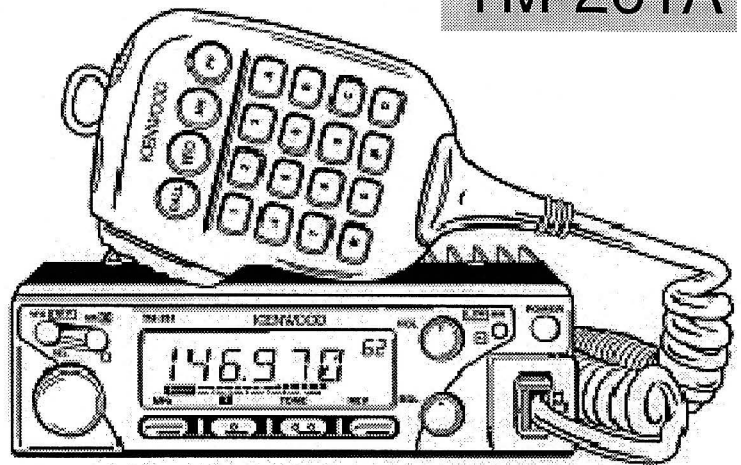
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

Expansion Range

138 Mhz - 165 Mhz

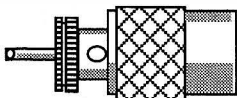
Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Disconnect power and antenna.
2. Remove the top cover (2 screws)
3. Locate and cut the GREEN wire (W1)
4. Reassemble the radio.
5. Reset the microprocessor
Press and hold [MR] and turn the power on.

Cut W2 for MARS/CAP only

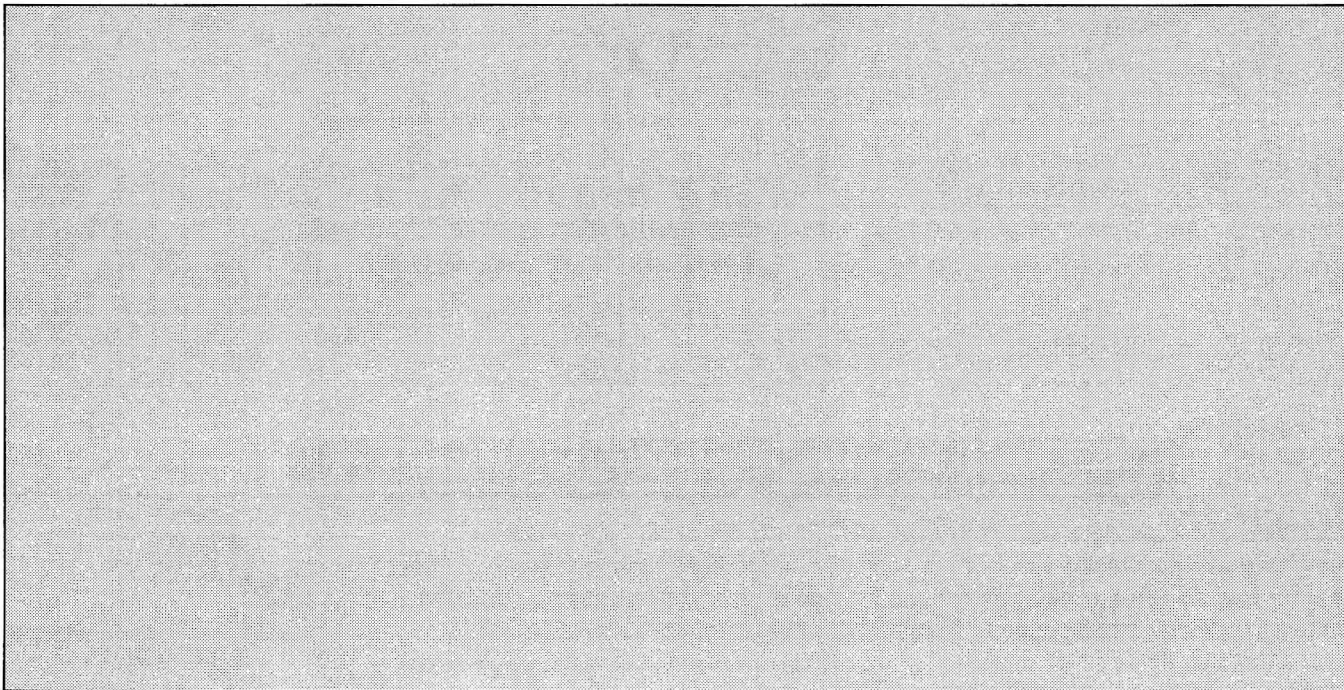


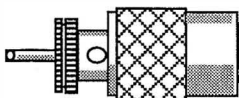
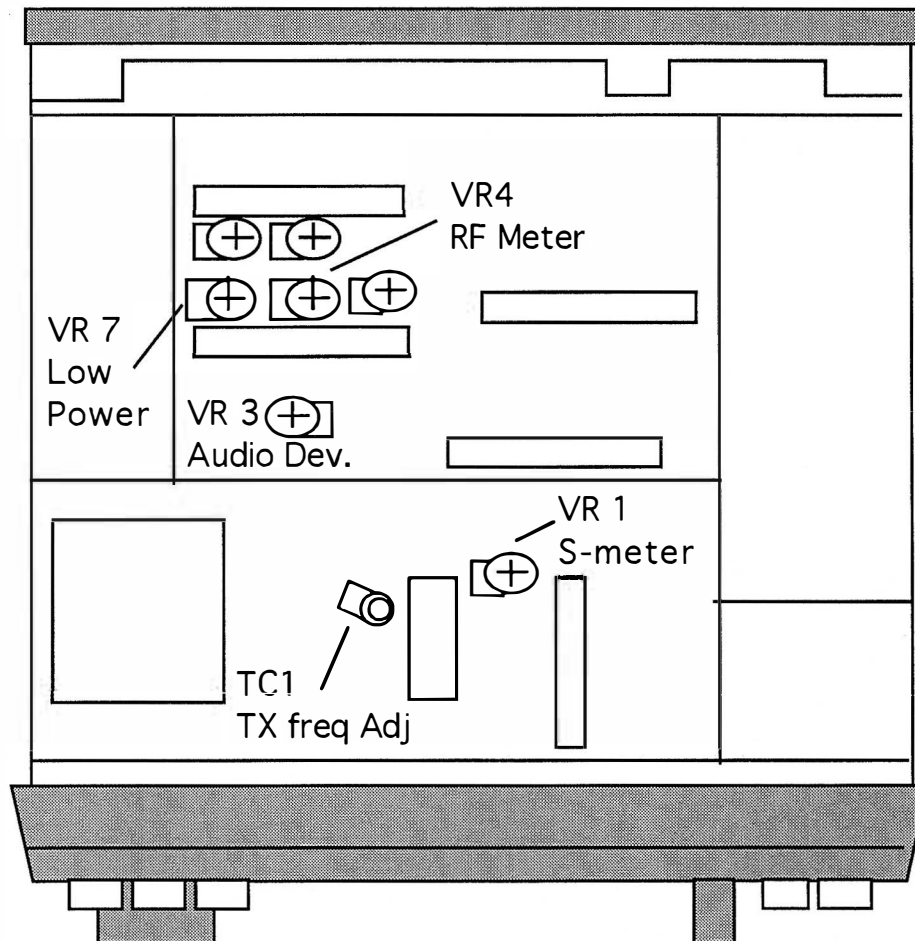
Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

Lined area for notes.





Radio/Tech Modifications Volume A

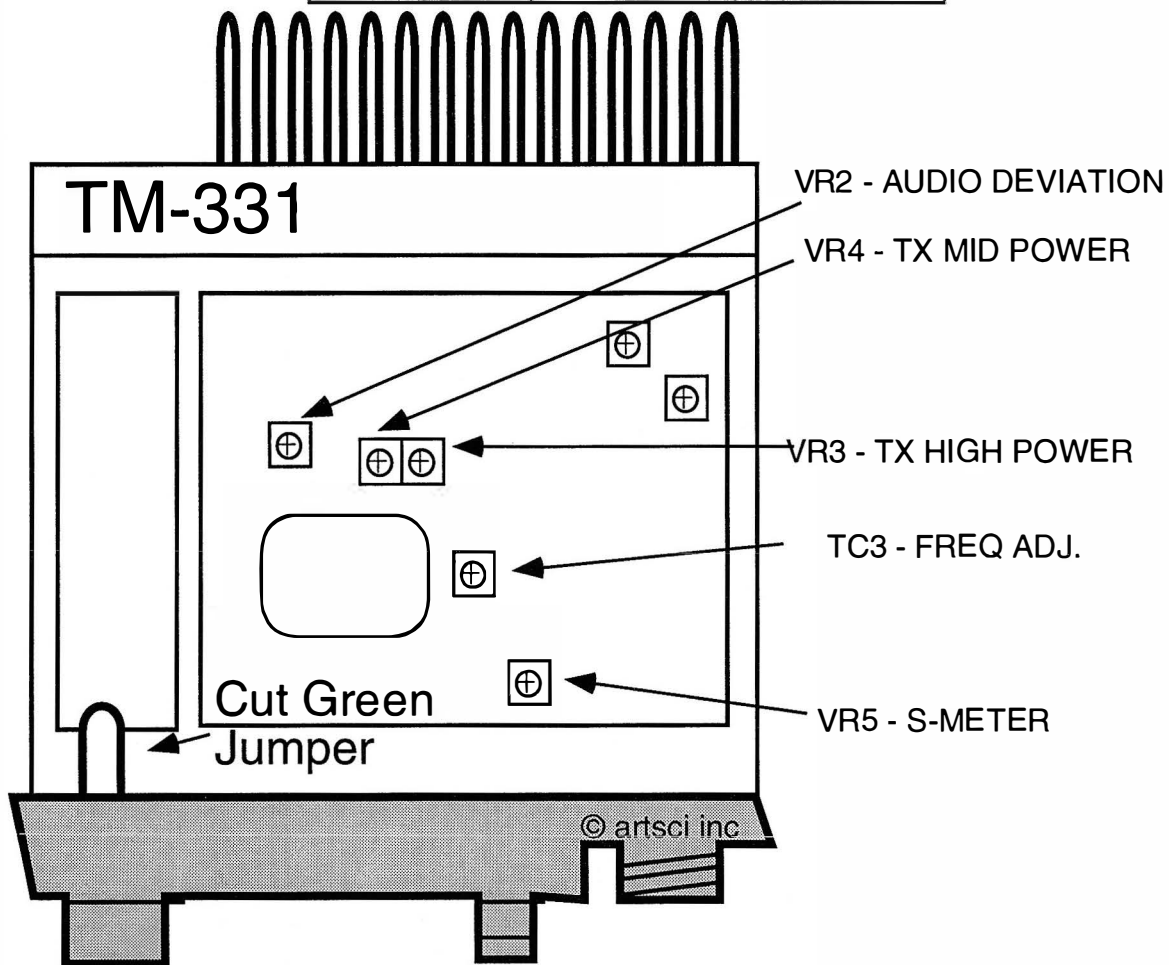
Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
 Have the original book with you when you call with a question. **Use at your own Risk!**
 The Author and all other parties take no responsibility for any damages or violations
 caused by these modifications. Some modifications may violate FCC rules.
 (818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© *artsci*

Expansion Range

215 - 229 MHz

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Remove power and antenna.
2. Remove top cover.
3. Locate and **cut Green jumper**.
4. Reassemble the radio.
5. **Reset the Microprocessor.** (Hold [MR] and turn power on)

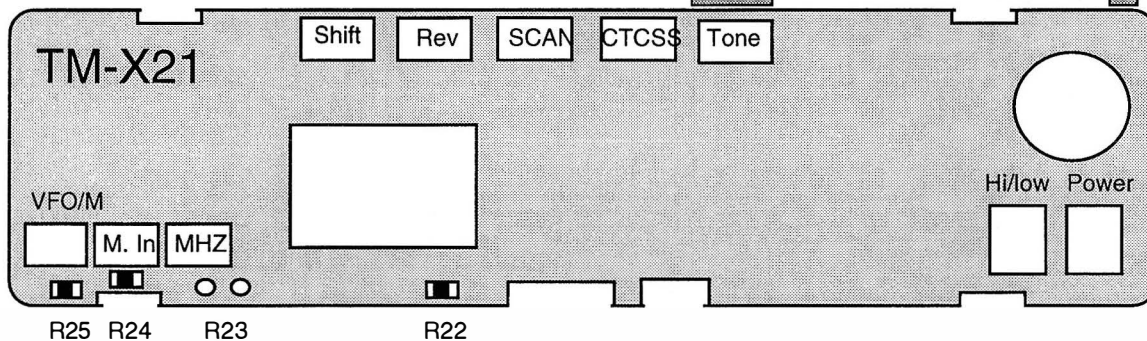
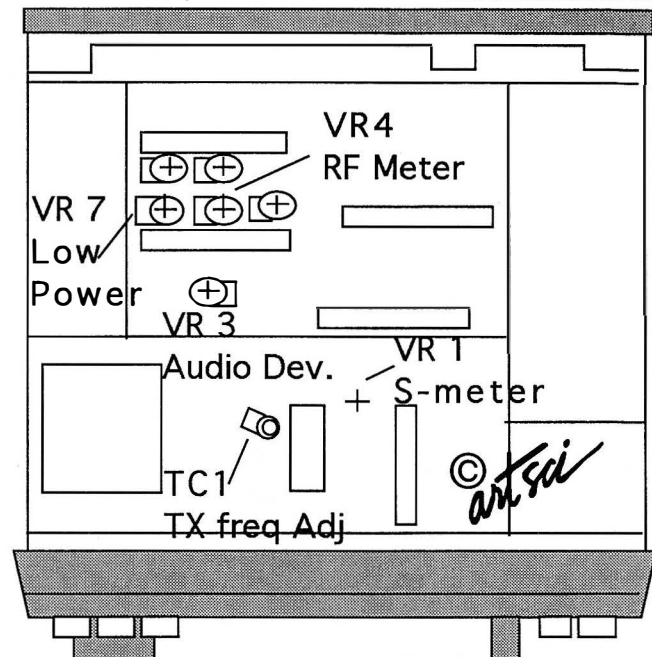
Receive and Transmit Expansion

KENWOOD
TM-421A

Expansion Range

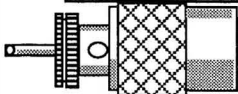
The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Remove power and antenna.
2. Remove the top and bottom covers
3. Remove the channel knob
4. Remove the microphone ring.
5. Remove the volume and squelch knobs
6. Remove the front panel from the unit.
7. Remove the front control unit from the chassis.
8. Locate component side of the Control unit circuit board.
9. Locate chip Resistor R-25.
10. **Remove R-25** and place it in the empty position R-23.
11. **Remove R-22.**
12. Reassemble the radio.
13. **Reset the microprocessor.** (Press and hold [MR] while turning on the power)
(Press and hold [VFO/M] and [M.IN] and turn power on.)



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

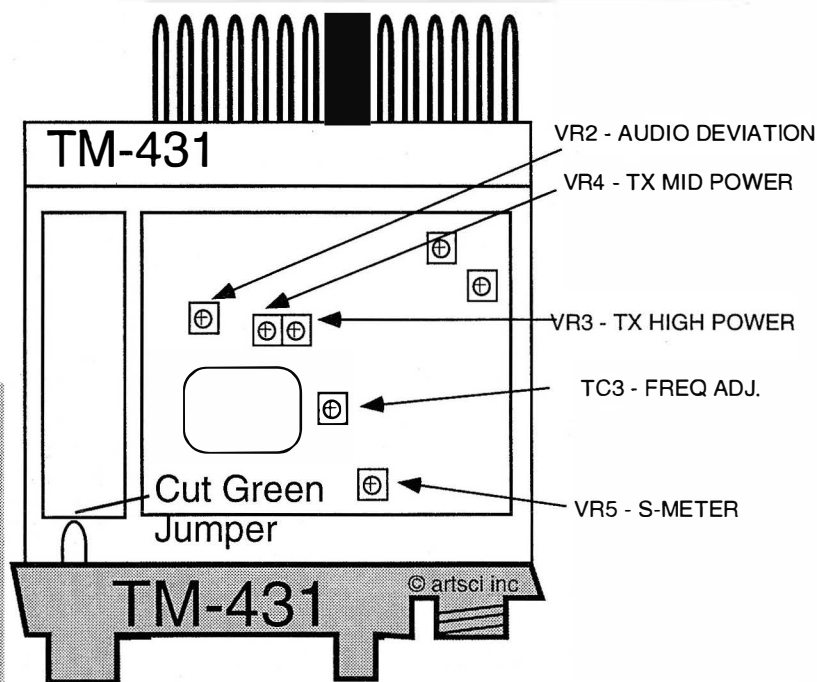
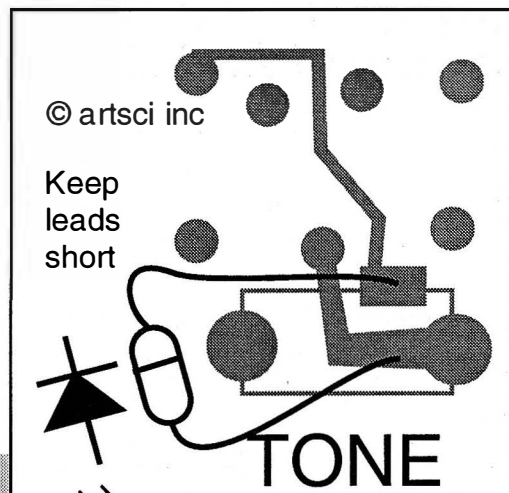
Kenwood - 29



Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 420 - 469 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

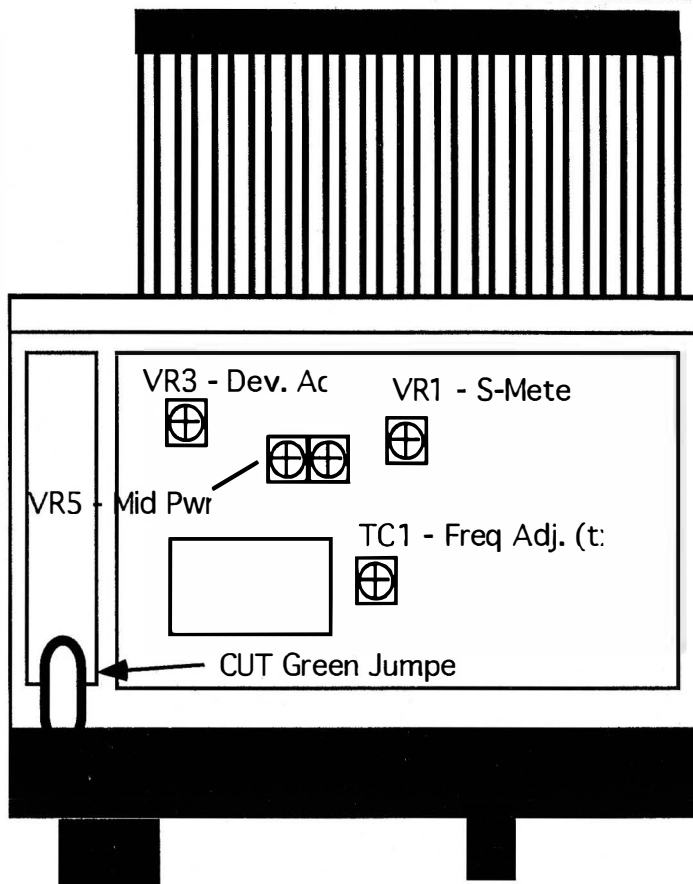
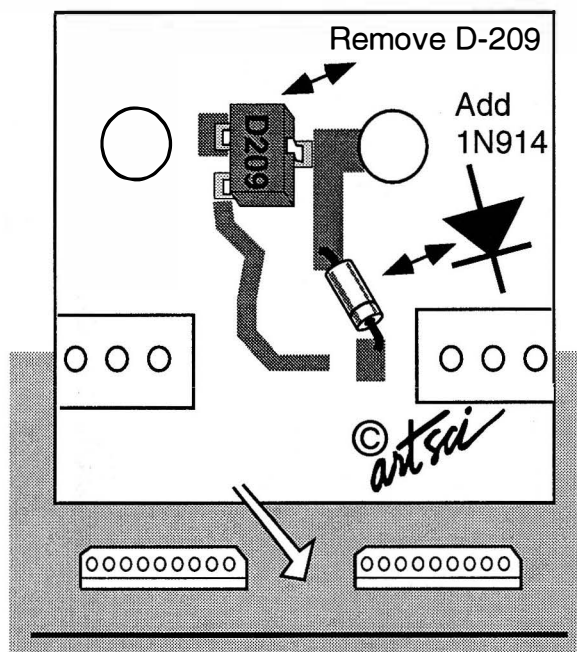


Expanded RF Modification

1. Disconnect the power and antenna.
2. Remove the top and bottom cover.
3. **Cut the green jumper** and tape the edges to prevent them from shorting.
----- Stop here on most radios. -----
4. Remove all knobs from front panel.
5. Remove the nut from the mic jack and the nut from the channel switch.
6. Remove four screws holding the front panel.
7. Remove the three screws from the control board.
8. Locate the green jumper wire sticking out the front panel, behind the VFO Button.
9. **Install diode D209** Part # MA141A on control board or use a 1N914 as shown.
(Some reports state that D209 will cause the display to 2 meters)
10. Reassemble the radio
11. **Reset the microprocessor.** (Press and hold [MR] while turning on the power)

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 420 - 449 Mhz(green wire) 350-512 MHz (diodes). Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Note: The Diode modification is new in the eighth version of this book. It is untested as of press time.

Expanded RF Modification

1. Disconnect the power and antenna.
2. Remove the top and bottom cover.
3. Remove all knobs from front panel.
4. Remove the nut from the mic jack and the nut from the channel switch.
5. Remove four screws holding the front panel.
6. Remove the three screws from the control board.
7. Locate the green jumper wire sticking out the front panel, behind the VFO Button.
8. **Cut the green jumper** and tape the edges to prevent them from shorting.
9. **Remove diode D209** Part # MA141A on control board as shown.
10. **Install a 1N914 as shown**
11. Reassemble the radio
12. **Reset the microprocessor.** (Press and hold [MR] while turning on the power)

Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

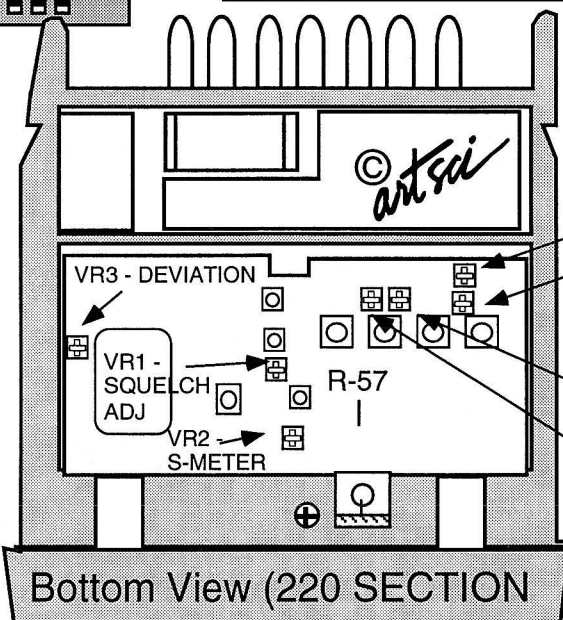
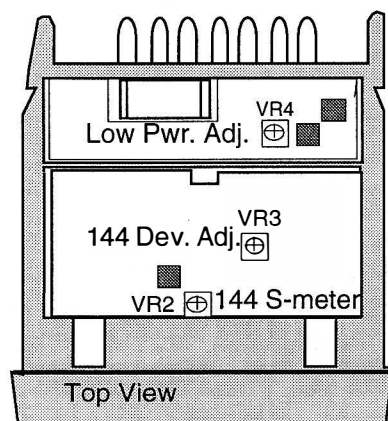
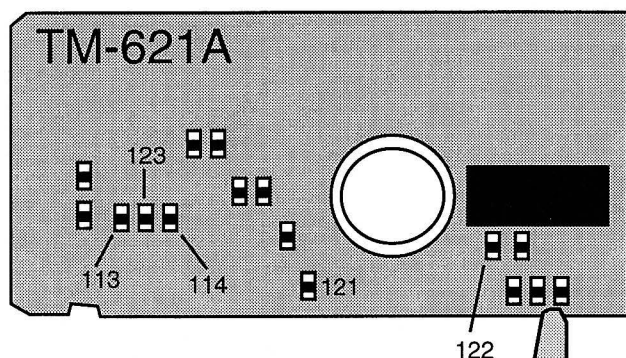
© artsci

TM-621A

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 210 - 239 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Disconnect the power and antenna.
2. Remove the top and bottom covers.
3. Locate and cut R57 on Control board. (Bottom side of radio)
4. Remove the silver colored screws from the front panel.
5. Carefully pull the front panel away from the body of the transceiver.
6. Locate chip resistor R113 and R114 on the Control board. (inside front panel)
7. Remove the chip resistor located between R113 & R114. It is labeled R123.
8. **Remove chip resistor R121** (cross band repeater mod)
9. **Remove R122** (disable 3 minute time out timer).
10. Reassemble radio.
11. **Reset the microprocessor** (Press and hold [F] while turning power on).

Cross Band Repeater Instructions

Turn on / off : Press F and then press A.B.C. Key.

Three dots should appear in the display when the mode is on.

Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

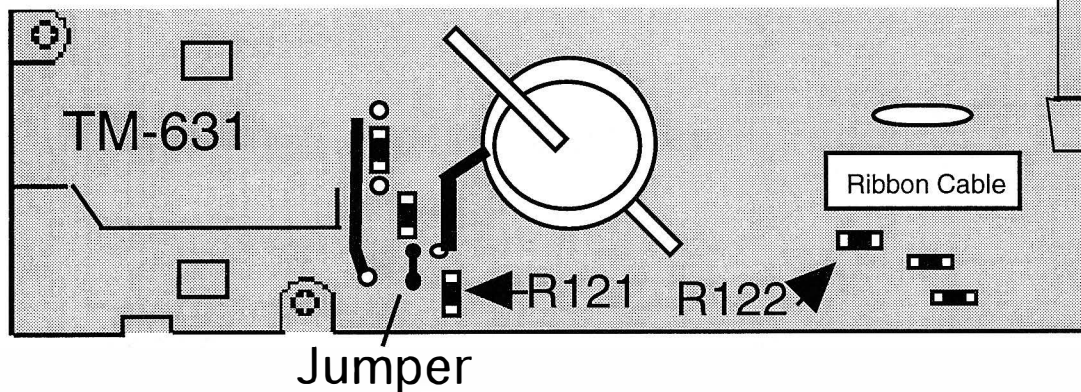
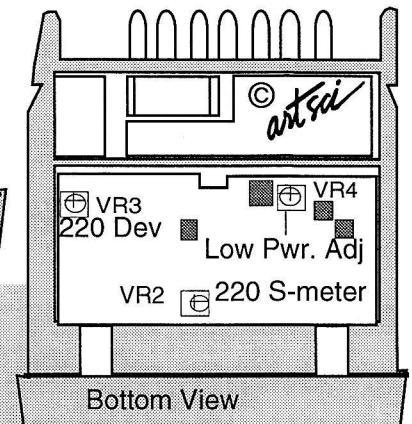
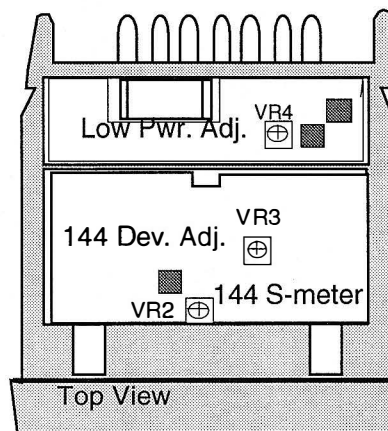
Receive and Transmit Expansion

KENWOOD
TM-631A

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 210 - 239 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Remove power and antenna and the top and bottom covers.
2. CUT RESISTOR R25. R25 is located on the Control unit on the bottom side of the Radio. The resistor can be seen by looking through the cutout of the chassis just behind the front panel.
3. Remove silver color screws from the front chassis. The screws are located 2 on each side, 1 on the top and 1 on the bottom.
4. Pull the front panel away from the radio. Do not unplug any cables.
5. Install a jumper wire see diagram 1. (Some models this will not work properly)
6. **Remove R121.** (This is the Cross band repeater mod.)
7. **Remove R122.** (This will override the automatic 3 minute time out timer)
8. Reassemble the radio.
9. **Reset the microprocessor twice.** Press and hold the [MR] key and turn radio on.

Cross Band Repeater Instructions

The TM-631 will receive a signal on one band and will automatically re-transmit it on the other band. Each band can contain shift information. Only one band may contain PL encode/decode information. Do not turn Tone and CTCSS on in one band.

Turn on / off : Press [F] and then press [A.B.C.] Key.

Three dots should appear in the display when the mode is on.

Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

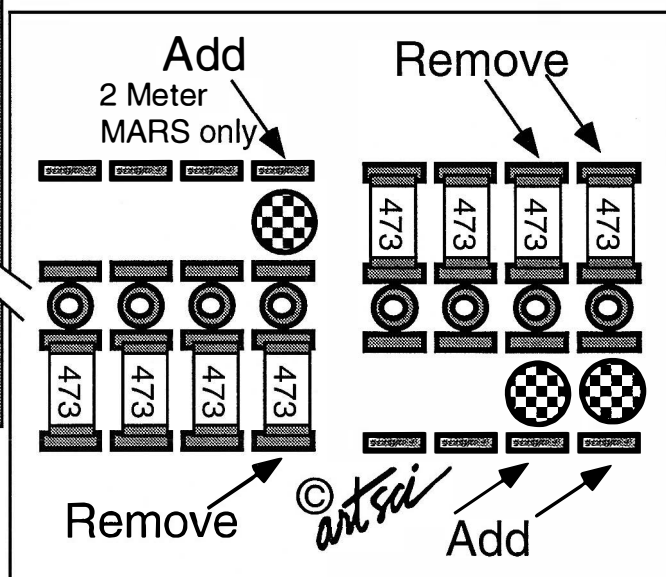
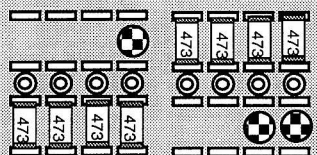
Kenwood - 33

KENWOOD

Expansion Range

(28 MHz - 18-54 RX/26-45 TX)
 (50 MHz - 40-90 RX/46-76 TX)
 (144 MHz - 136-184 RX/TX)
 (220 MHz - 215-260 RX 215-235 TX)
 (440 MHz - 410-470 RX/TX)
 (1.2 GHz - 1100 - 1400 RX/TX)

TM-642 & 742 & 942



Expanded RF Modification

1. Remove power and antenna.
2. Remove the front panel from the main body.
3. Remove the 4 screw on the bottom cover.
4. Loosen the 4 screws on the side of the radio.
5. Locate the control unit (the large board near the front panel area).
6. **Remove chip resistors** as indicated below (You will be using them in the next step).
7. **Install chip resistors** as indicated.
7. Reassemble the radio.
8. **Reset the microprocessor** (Press and hold the [MR] key and turn power on)

For 800 RX :press and hold [MHz] for 1 second.

An 800 MHz antenna should be connected to the copper pad of IC9 Pin 1 on UHF board.

Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

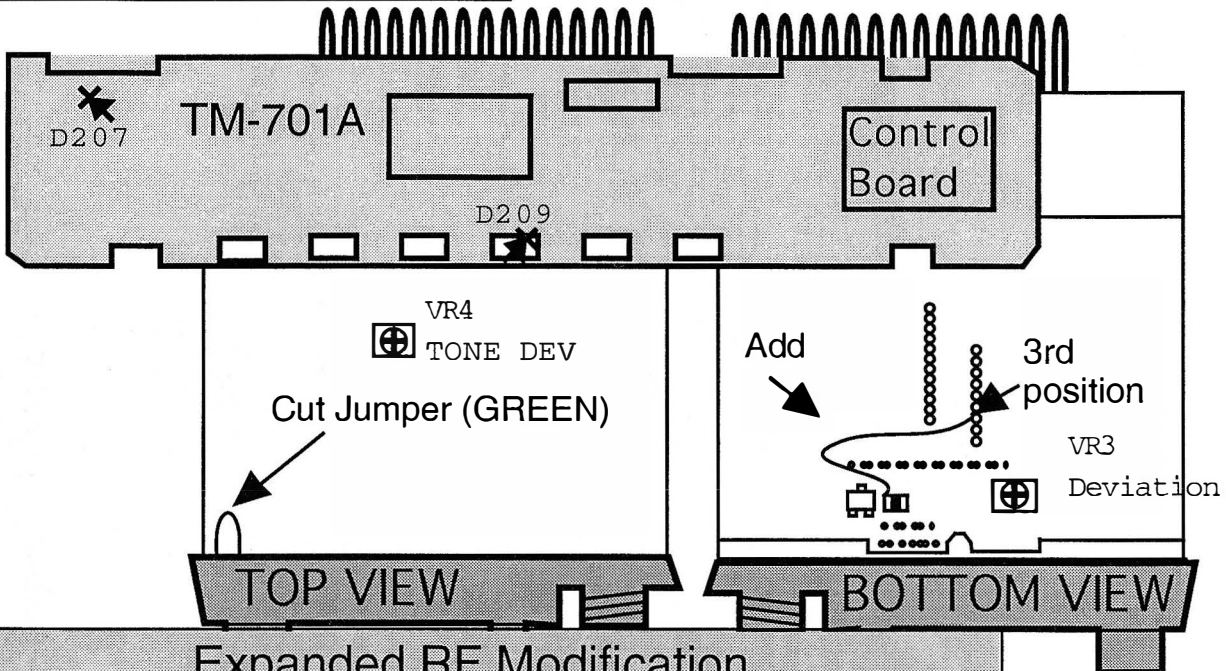
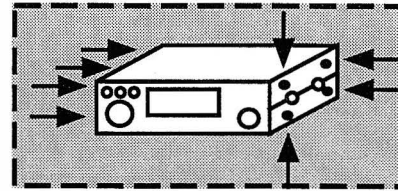
Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz. Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



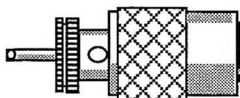
Expanded RF Modification

1. Disconnect the power and antenna.
2. Remove the top and bottom cover.
3. Remove knobs from front panel and the nuts from the mic and channel switch.
4. Remove 4 screws holding the front panel and the 3 screws on the control board.
5. Locate the green jumper wire sticking out the front panel, behind the VFO button.
6. **Cut the green jumper** and tape the edges to prevent them from shorting.
7. Optional: Install diodes D207 & D209 on control board X57-3350-00.
8. **Solder a jumper** to the foil side of the TX-RX board as shown in drawing.
9. Reassemble the radio.
10. **Reset the microprocessor** (Press and hold [MR] while turning on the power).

Cross Band Repeater Instructions

Turn on : Press and hold [F] and then press [DUP]. Then Press [F] longer than 1 Second. The F indicator will blink. Press [LOW]. Three dots should appear in the display when the mode is on.

Turn off : Press [VFO].



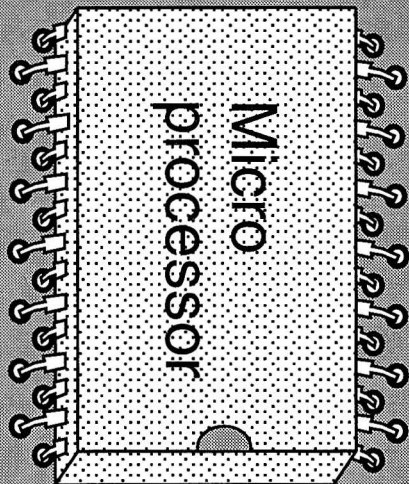
Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

©artsci

Expansion Range

142.000 MHz - 151.995 MHz



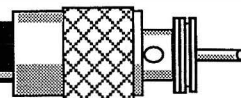
TM-711 00B

© artsci

- D32 empty
- D31 installed
- D34 add
- D30 remove
- D33 installed

Expanded RF Modification

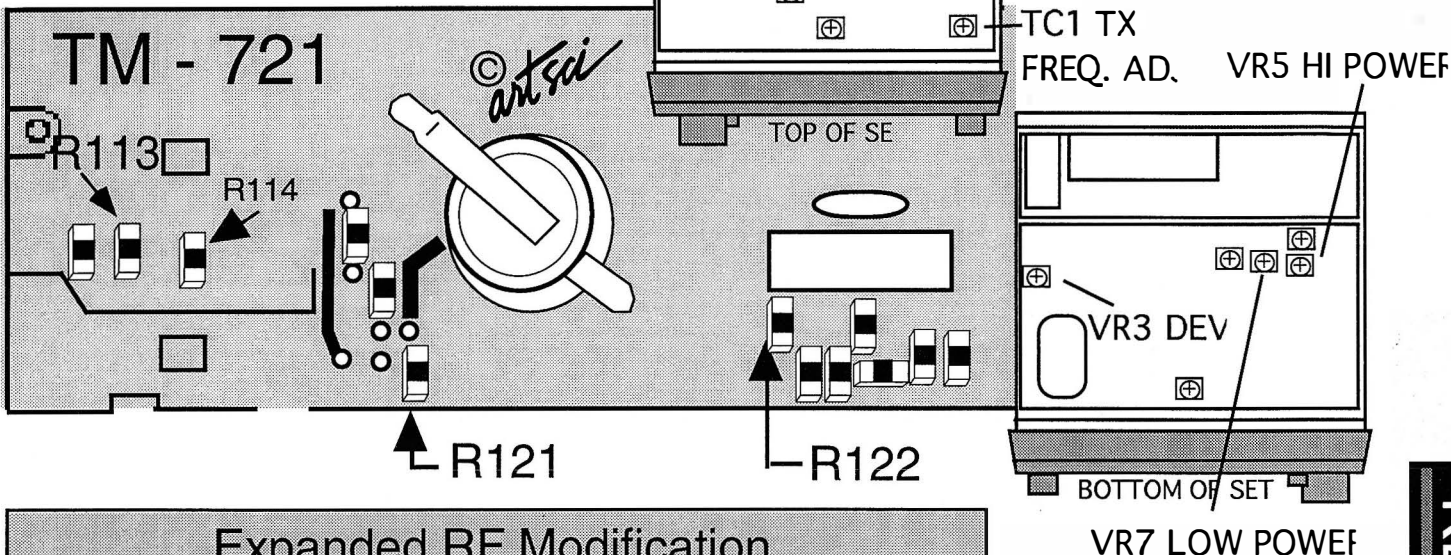
1. Disconnect the power and antenna.
2. Remove the top cover.
3. Locate the microprocessor.
4. Locate and **cut diode D30**.
5. Solder **install a 1N914** in position D34
6. Reassemble the radio.



Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



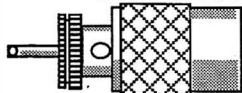
Expanded RF Modification

1. Remove power, antenna and the top and bottom covers.
2. Remove the six silver screws holding the front panel to the chassis.
3. Locate R113 and R114
4. **Solder a jumper** between the open pads between R113 & R114
5. **Remove R121.** (This is the cross band repeater mod.)
6. **Remove R122.** (This will override the automatic 3 minute time out timer)
7. **Cut R57** from the board facing the onbe shown above. Do not cut R58
8. Reassemble the radio
9. **Reset the microprocessor twice.**
Press and hold the MR key and turn the power switch. Do this twice.

Cross Band Repeater

The TM-721 will receive a signal on one band and will automatically re-transmit it on the other band. Each band can contain shift information. Only one band may contain PL encode/decode information. Do not turn tone and CTCSS on in one band.

Turn on / off: Press F and then press A.B.C. Key. Three dots should appear in the display when the mode is on.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

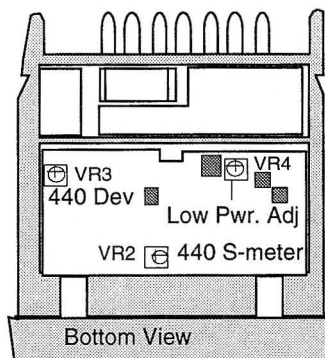
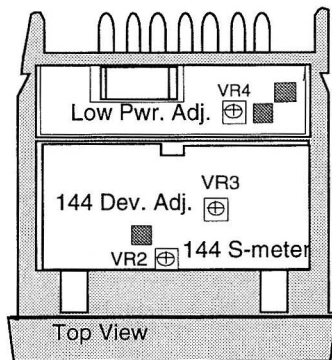
Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

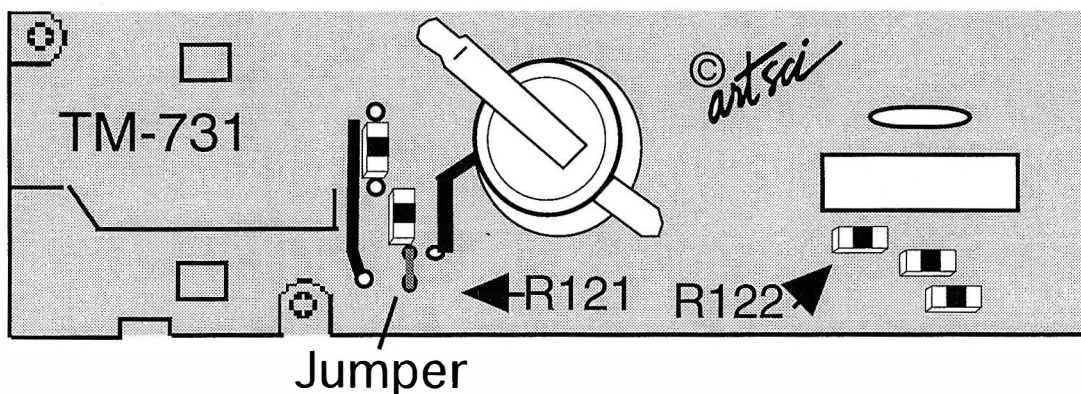
TM-731A



Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Remove power and antenna and the top and bottom covers.
2. **CUT RESISTOR R25.** R25 is located on the Control unit on the bottom side of the Radio. The resistor can be seen by looking through the cutout of the chassis just behind the front panel.
3. Remove silver color screws from the front chassis. The screws are located 2 on each side, 1 on the top and 1 on the bottom.
4. Pull the front panel away from the radio. Do not unplug any cables.
5. **Install a jumper wire** as shown in diagram 1.
6. **Remove R121.** (This is the Cross band repeater mod.)
7. **Remove R122.** (This will override the automatic 3 minute time out timer)
8. Reassemble the radio.
9. **Reset the microprocessor twice.** Press and hold the [MR] key and turn radio on.

Cross Band Repeater Instructions

The TM-731 will receive a signal on one band and will automatically re-transmit it on the other band. Each band can contain shift information. Only one band may contain PL encode/decode information. Do not turn Tone and CTCSS on in one band.

Turn on / off : Press [F] and then press [A.B.C.] Key. Three dots should appear in the display when the mode is on.

Radio/Tech Modifications Volume A

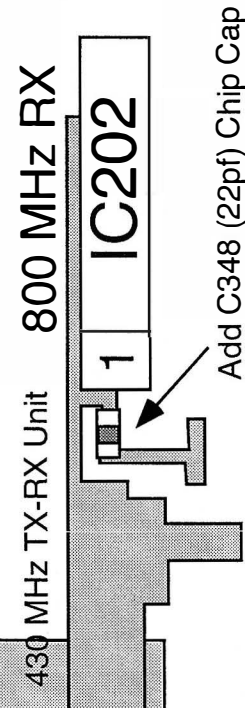
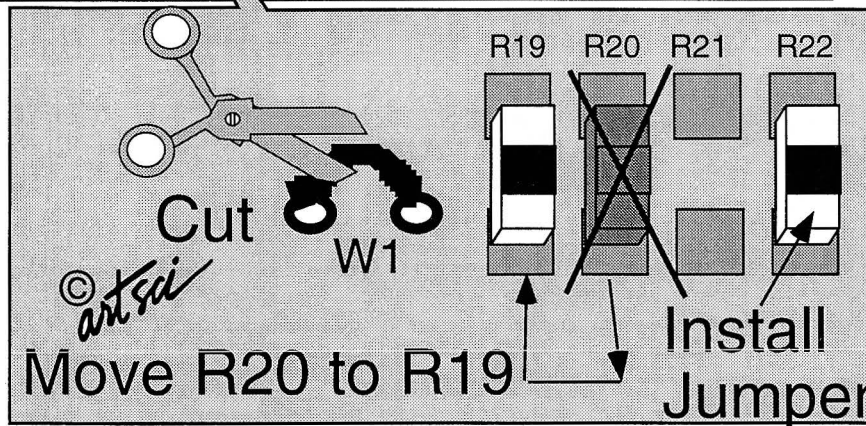
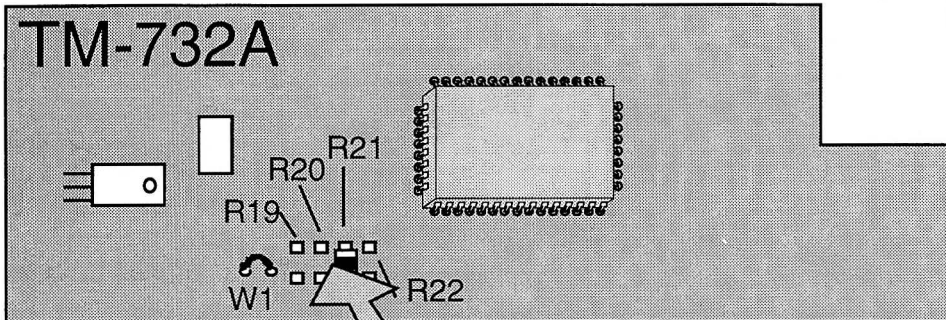
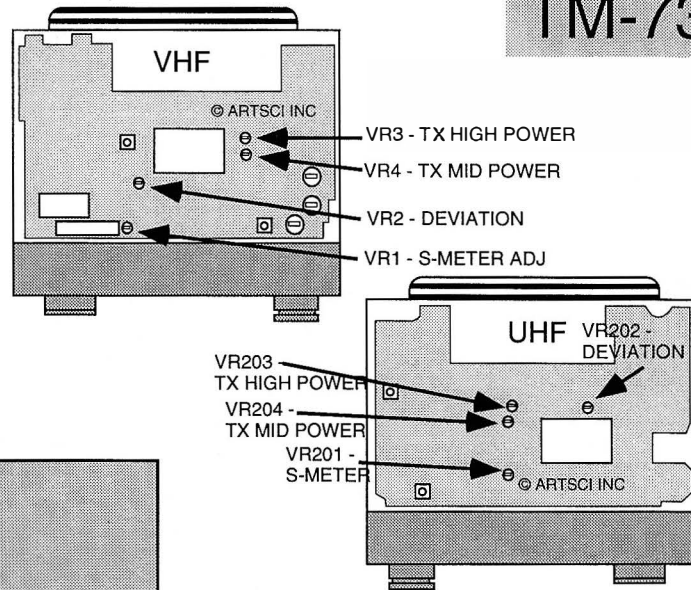
Receive and Transmit Expansion

KENWOOD
TM-732A

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz & 420 - 469 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



Expanded RF Modification

1. Remove power, antenna and the top and bottom covers.
2. Remove front display and expose circuit board.
3. **Clip Jumper W1.** (Expanded RX and 800 MHz) This may cause some problems in later models of the radio. **YOU MAY NOT NEED THIS STEP.**
4. **Remove Resistor R20 & R21** if present.
5. **Place a jumper** in position R19 & R22. (R22 not required in some models)
6. **Add a 22pf chip cap** in position C348 on the 440 TX-RX board. (800 MHz RX mod)
7. Reassemble the radio.
8. **Reset the microprocessor.** (Press [MR] & [VFO] & turn the radio on)

Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

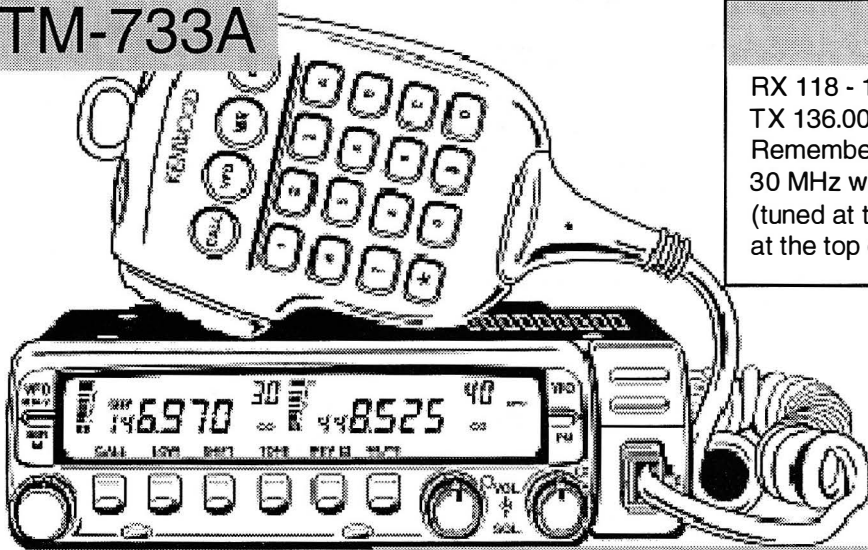
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

Kenwood - 39

TM-733A



Expansion Range

RX 118 - 173.995 MHz, 300.000 - 469.975 MHz

TX 136.000 - 173.995 MHz, 410.000 - 469.975 MHz

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

Jumpers connected to other side of circuit board

B2 B3

TM-733A

Remove B0 for full expansion

Cut B2 for MARS only

Control Unit Viewed from rear of the board looking forward.

Cross Band operation:
Press and hold [FUNC] for 1 second and then press crossband key (rightmost key)

RESET

Press and hold **MR** and turn the radio on.

Release **MR**
The display will begin flashing

Press **MR**

Expanded RF Modification

- 1 Remove power, antenna and the top covers.
- 2 Unplug the speaker and set it aside.
- 3 Remove the front panel (with display)
- 4 Remove the blank front panel (6 pull-up tabs)
- 5 Unplug the flat cable from the socket on top of the mic board
- 6 Remove the felt protector.
- 7 Remove the two phillips screws.
- 8 Fold top of mic connector board forward.
- 9 Locate and **remove chip "B0"**. (see drawing)
- 10 Plug the speaker back in.
- 11 Reassemble the radio.
- 12 **Reset the microprocessor**
(Press and hold the [MR] and turn power on)

Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

Receive and Transmit Expansion

KENWOOD

TM-741A
TM-641A

Expansion Range

(28 MHz - 18-54 RX/26-45 TX)
(50 MHz - 40-90 RX/46-76 TX)
(144 MHz - 118-174 RX/TX)
(220 MHz - 215-260 RX 215-235 TX)
(440 MHz - 410-470 RX/TX)
(1.2 GHz - 1100 - 1400 RX/TX)

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.

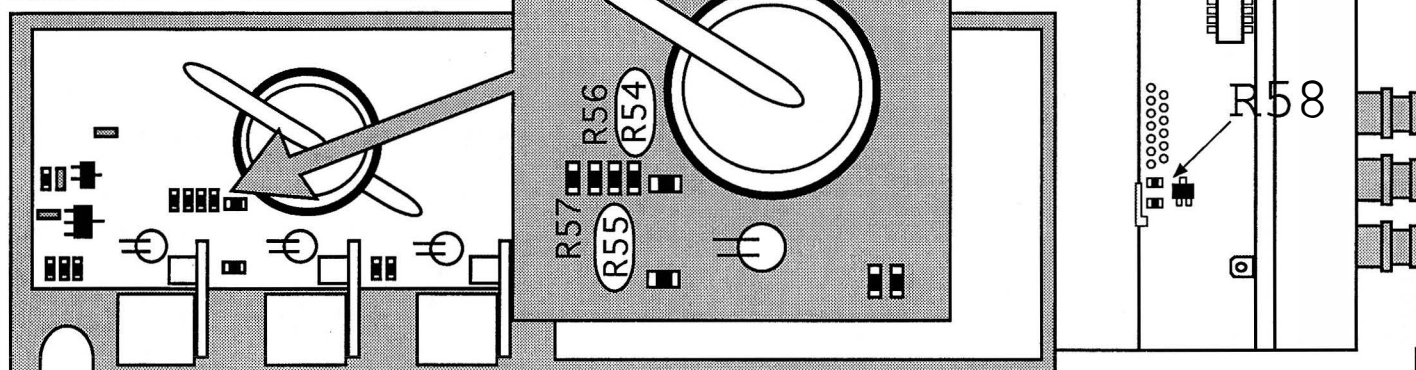
CROSS BAND OPERATING PROCEDURES:

The TM-X41 will receive a signal on one band and will automatically re-transmit it on the other band. Each band can contain shift information. Only one band may contain PL encode/decode information. Only one band may contain Tone and CTCSS.

1. Select one of the band using the BAND SELECT key.
(The PTT indicator will light.)
2. Select the other band by pressing the CONTROL SELECT key
(Skip this step for one way repeat only)
(The green light on the key will light.)

Turn on / off the Repeater mode :

Press the [F] key and then press the [MUTE] key.



For Cellular reception, a new 900 Mhz antenna connector must be attached. Attach coax to solder pad attached to input side of IC9 and can come out through notch in the shield plate. Select the 440 Band and press and hold the [MHz] key down for at least one second.

For 100 extra memory channels: Press and hold [F] and press [REV]. Press again to return to normal memory.

Play some games

Press and hold [F] and [MUTE] and turn on power.
(press [VFO] to return to normal operation)
Press band 1, 2 or 3 to select game.

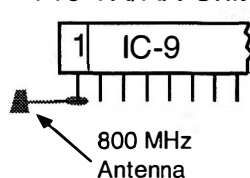
- 1 = Slot Machine
- 2 = Space Invaders
- 3 = Musical keyboard)

You must use the front panel & microphone keys to play the games.

Expanded RF Modification

1. Remove power and antenna
2. Detach the front control head assembly.
3. Locate and **cut the GREEN wire** on the control board. The control board is on the body of the radio. The GREEN wire is located towards the left edge of the board. Tape the edges of the green wire to prevent shorting.
4. Remove the back cover from the control head.
5. Locate and **remove chip resistors R54 and R55**. Caution should be taken while removing these resistors.
6. Locate and Remove Chip resistor R58 (it's blue in color) on the radio body. See drawing.
6. Reassemble the control head.
7. Reassemble the transceiver.

440 TX/RX Unit



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

Kenwood - 41

KENWOOD

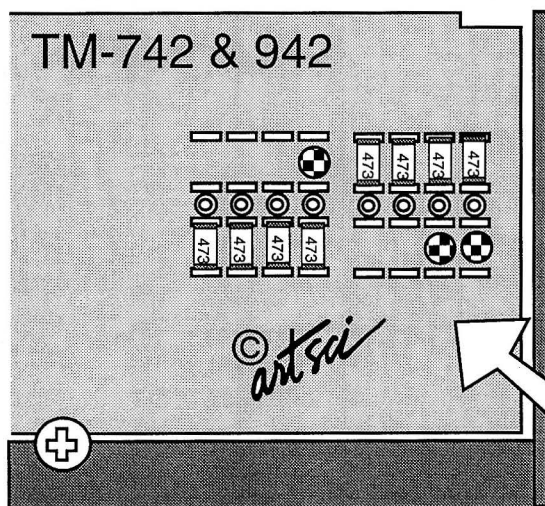
TM-742
TM-942

100 More Memory Channels

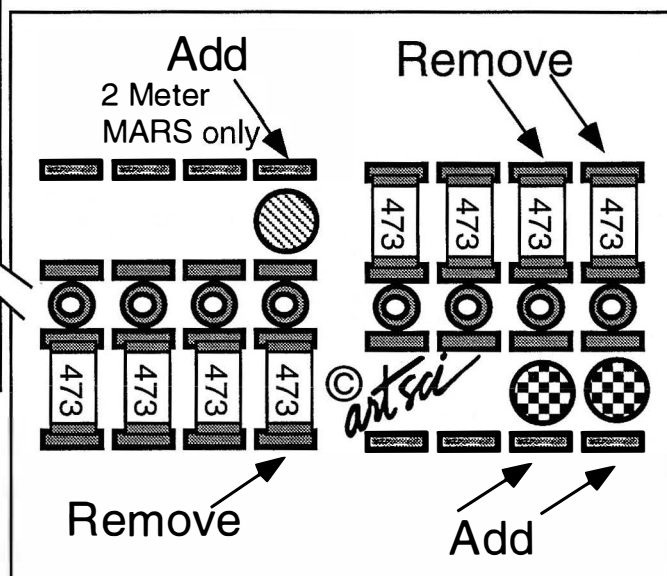
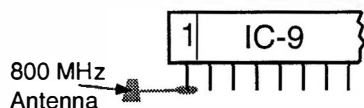
In Memor Mode,
Press & Hold [F] & Press [REV]
Memor channels A1 - J0

Expansion Range

(28 MHz - 18-54 RX/26-45 TX)
(50 MHz - 40-90 RX/46-76 TX)
(144 MHz - 136-184 RX/TX)
(220 MHz - 215-260 RX 215-235 TX)
(440 MHz - 410-470 RX/TX)
(1.2 GHz - 1100 - 1400 RX/TX)
Remember that the electronic circuits
can only tune a 20-30 MHz window
around the original center frequency
(tuned at the factory) you may have
better performance at the top or the
bottom ends of the tuneable range.



440 TX/RX Unit



Expanded RF Modification

1. Remove power and antenna.
2. Remove the front panel from the main body.
3. Remove the 4 screw on the bottom cover.
4. Loosen the 4 screws on the side of the radio.
5. Locate the control unit (the large board near the front panel area).
- You may need to lift the metal plate to access the following parts.----
6. **Remove chip resistors** as indicated below (You will be using them in the next step).
7. **Place two chip resistors** in the locations shown (Checkboard pattern)
8. Reassemble the radio.
9. **Reset the microprocessor** (Press and hold the [MR] key and turn power on)

For 800 RX : press and hold [MHz] for 1 second. An 800 MHz antenna should be connected to the copper pad of IC9 Pin 1 on UHF board.

Not all Serial numbers have 800 MHz!!

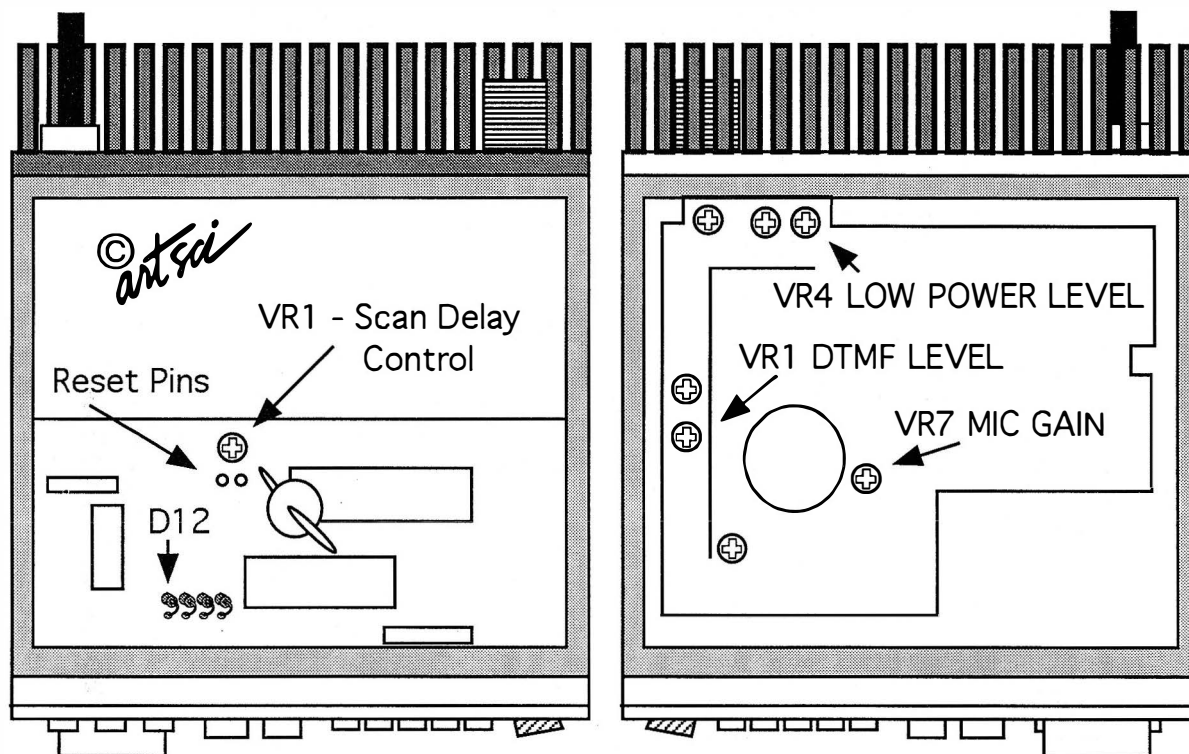
Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations
caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

Expansion Range

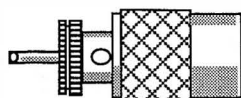
The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 150.995 Mhz.

TM-2530
TM-2550
TM-2570



Expanded RF Modification

1. Disconnect the power and antenna.
2. Remove the bottom case .
3. Locate the Control Unit on the bottom of the radio. This is the same board the TU-7 & MU-1 are mounted on.
4. **CUT diodes D8 & D11 & D12.** They are located to the left of IC 3.
5. Reassemble the radio.
6. **RESET the CPU.** (Press and hold the [PS] Key while turning on the radio.)



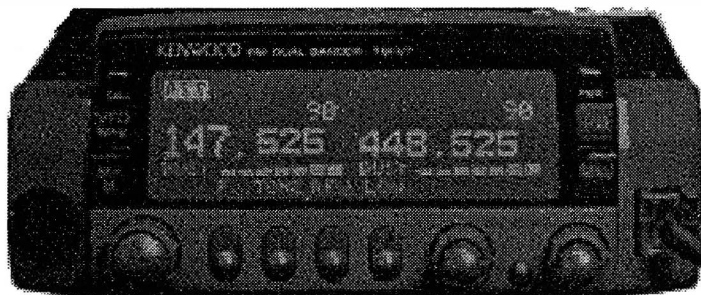
Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

Kenwood TM-V7A

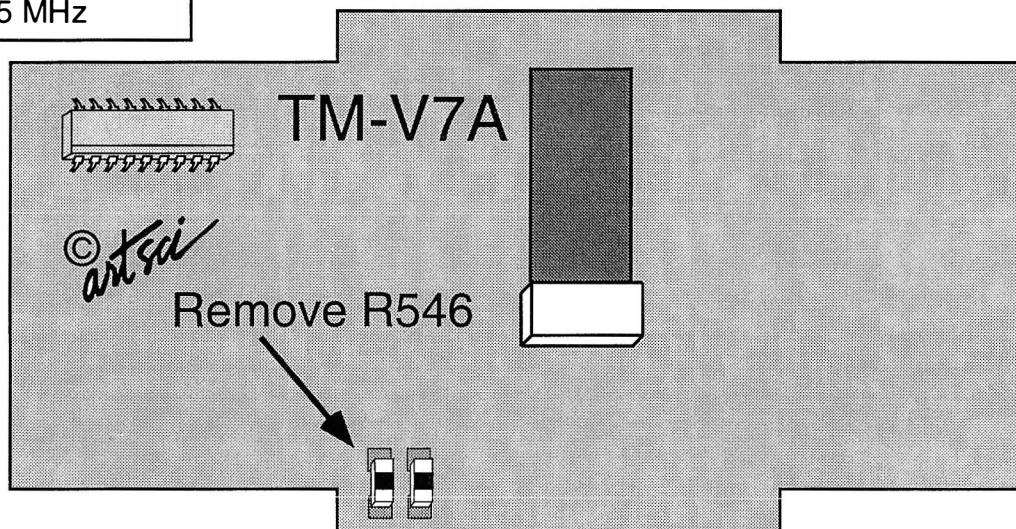
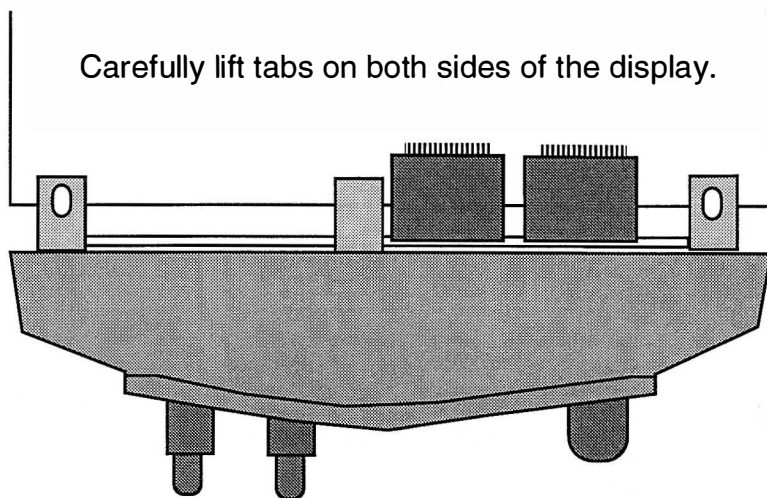
Receive and Transmit Expansion



Expansion Range

118-174 MHz RX
136-173.995 MHz
300-470 MHz RX
410-469.995 MHz

Carefully lift tabs on both sides of the display.



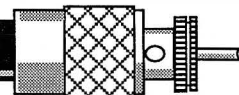
Expanded RF Modification

1. Disconnect the power and antenna from the radio.
2. Remove the top and bottom covers.
3. Carefully remove the front panel by lifting up the six locking tabs.
4. Tilt the front panel forward. Be careful not to damage the flexible cables that attach the front panel to the body of the radio.
5. Locate the two chip resistors on the right side of the ground spring.
6. Remove chip resistor R-546 (closest to the spring).
7. Make sure both green jumpers are not cut.
8. Reassemble the radio.
(The radio will automatically reset)

CAUTION:

This modification requires soldering or desoldering CMOS components. It requires special CMOS rated equipment and familiarity with surface mount soldering techniques.

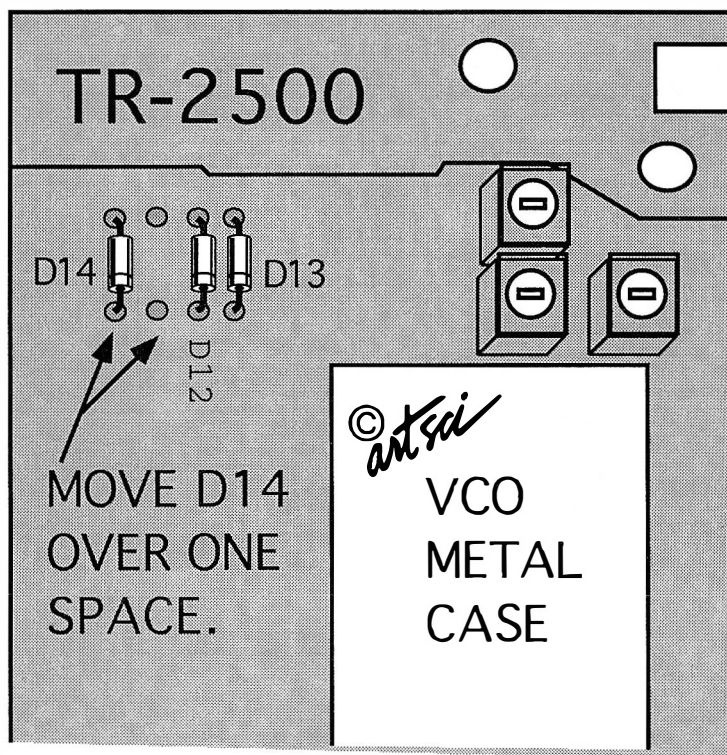
Radio/Tech Modifications Volume A



©artsci

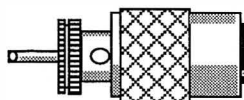
Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 141 Mhz - 151 Mhz.



Expanded RF Modification

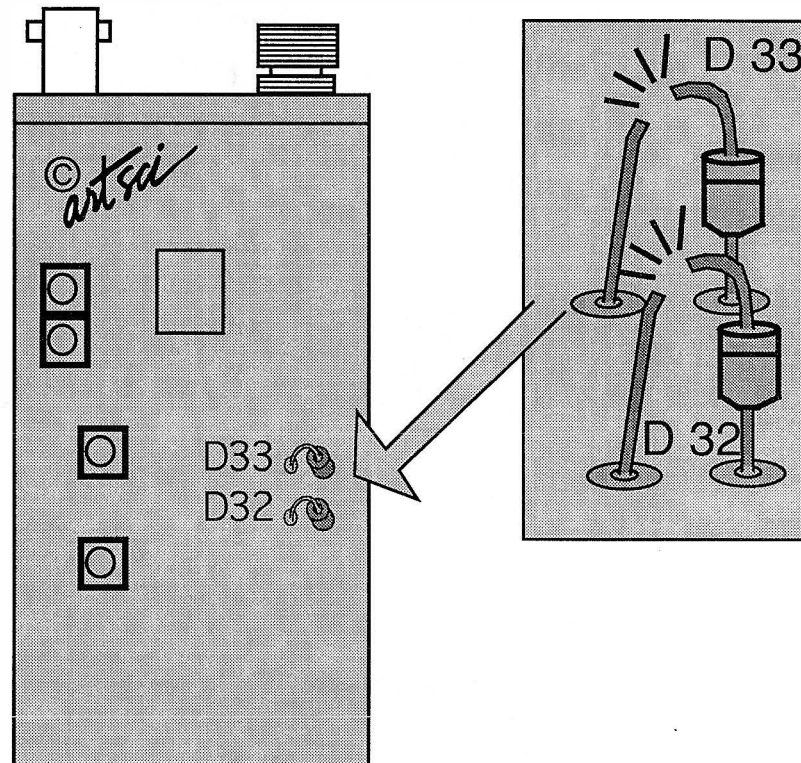
1. Disconnect the battery and antenna.
2. Remove the 3 screws holding on the back cover.
3. Remove the 2 screws on the bottom of the radio.
4. Unsolder the tabs of the lithium battery.
5. **Unsolder Diode D14.**
6. **Install the diode in the location next to D12.**
7. Reinstall the lithium battery.
8. Reassemble the radio.



Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz.

Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



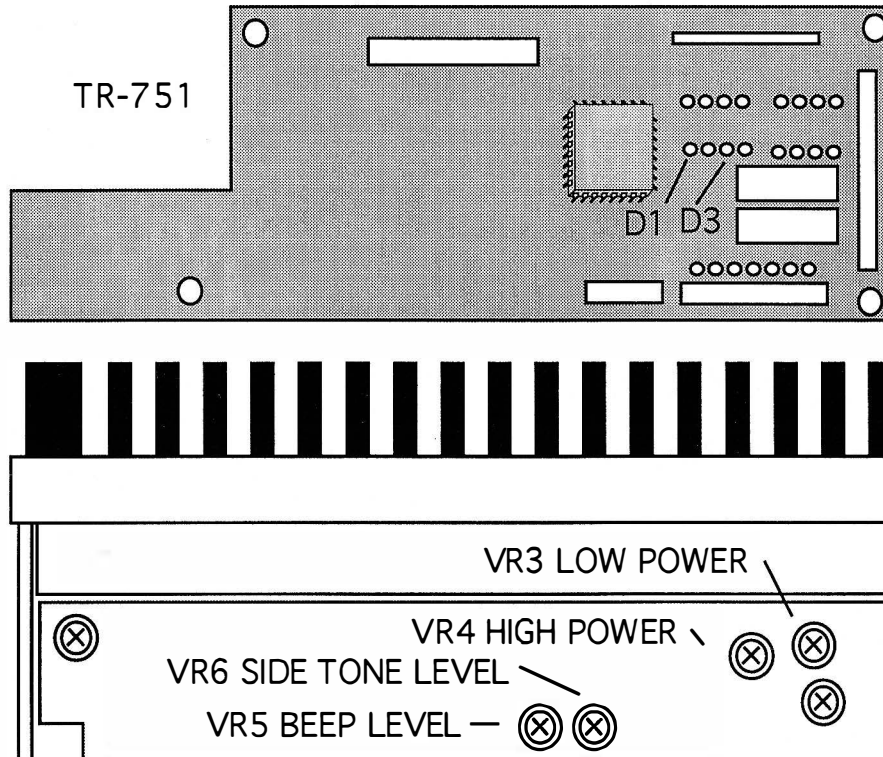
Expanded RF Modification

1. Disconnect the power and antenna.
2. Remove the screws and open the radio.
3. **Remove diodes D32 & D33.** They are located on the RX unit (x%%-1380-XX)
4. Press the RESET Switch
5. Reassemble the radio.

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from 138 Mhz - 165 Mhz.

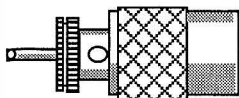
Remember that the electronic circuits can only tune a 20-30 MHz window around the original center frequency (tuned at the factory) you may have better performance at the top or the bottom ends of the tuneable range.



DEVIATION - VR7 ON RX UNIT (OTHER SIDE)

Expanded RF Modification

1. Disconnect the power and antenna.
2. Remove the case .
3. Locate the Control Unit on the radio.
4. **CUT diodes D1 & D3.** They are located to the left of IC 3.
5. Reassemble the radio.
6. **RESET the CPU.** (Hold [M] key and turn on power)



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
 Have the original book with you when you call with a question. **Use at your own Risk!**
 The Author and all other parties take no responsibility for any damages or violations
 caused by these modifications. Some modifications may violate FCC rules.
 (818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

Performance Report

Radio _____

Date _____

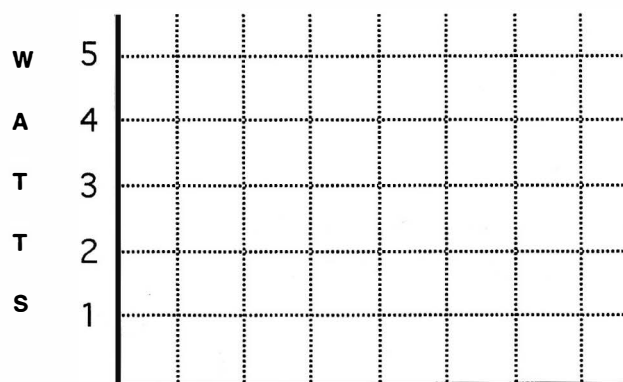
Owner : Name _____

Address _____

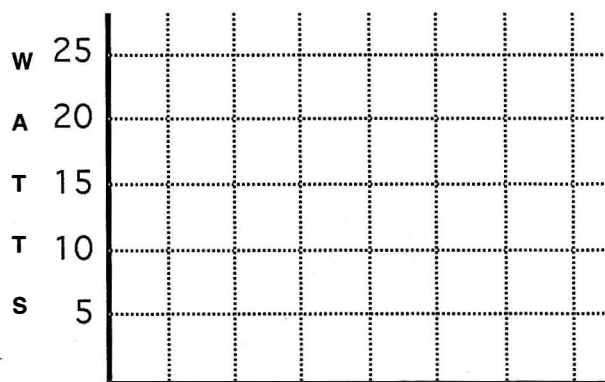
City _____ St. _____ Zip _____

Phone () - _____

Description	Before	After
Power out (Low)	_____ Watts	_____ Watts
Power out (High)	_____ Watts	_____ Watts
Frequency Error (Simplex)	_____ Hz	_____ Hz
Frequency Error (Offset)	_____ Hz	_____ Hz
Receive Sensitivity (Mid-band)	_____ uv	_____ uv
Receive Sensitivity (____ MHz)	_____ uv	_____ uv
Receive Sensitivity (____ MHz)	_____ uv	_____ uv
PL Deviation	_____ Hz	_____ Hz
DTMF Deviation	_____ KHz	_____ KHz
Audio Deviation	_____ KHz	_____ KHz
Lowest usable Freq @ .5 Pwr	_____ MHz	_____ MHz
Highest usable Freq @ .5 Pwr	_____ MHz	_____ MHz



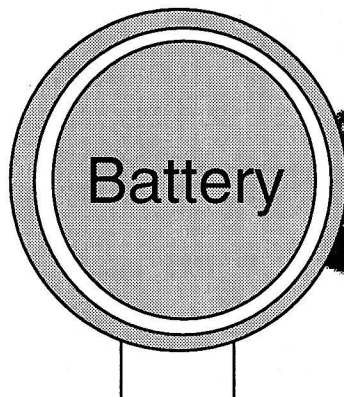
Frequency



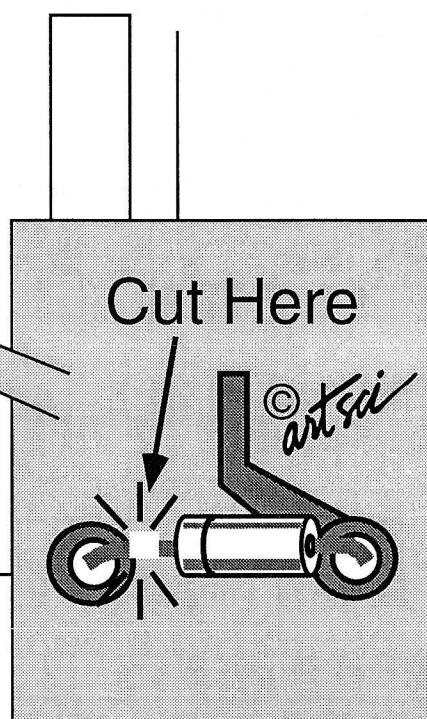
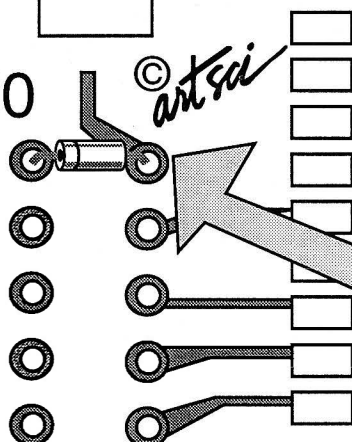
Frequency

Expansion Range

.5 Mhz - 30 MHz

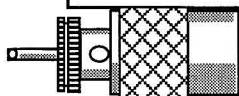


TS-50



Expanded RF Modification

1. Disconnect the power and antenna.
2. Remove the 5 screws holding on the bottom cover.
3. Loosen the 4 screws on the side of the radio & remove the bottom cover.
4. Place the radio upside down with the top towards you.
5. Locate and **remove Diode D5** on Digital unit. See diagram.
6. Reassemble the radio
7. **Reset the microprocessor** (Press and hold [A=B] and turn power on)



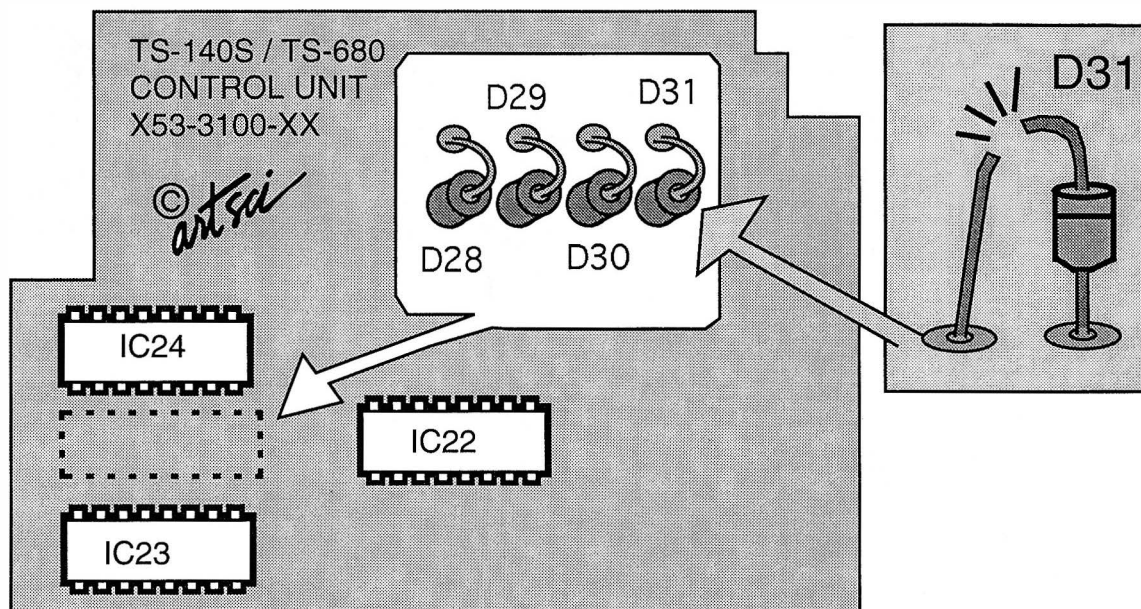
Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
 Have the original book with you when you call with a question. **Use at your own Risk!**
 The Author and all other parties take no responsibility for any damages or violations
 caused by these modifications. Some modifications may violate FCC rules.
 (818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from .5 Mhz - 30 Mhz .



Expanded RF Modification

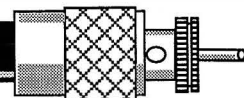
1. Disconnect the power and antenna.
2. Remove the top and bottom covers from the radio.
3. Locate the Control board on the bottom of the TS-140S
4. **Remove diode D31** on the Control board.
5. Reassemble the radio.
6. RESET the CPU.

Auxiliary Function

1. Put radio in VFO mode and turn power off.
2. Press and hold [VFO/M] & [LSB/USB] and turn power on.

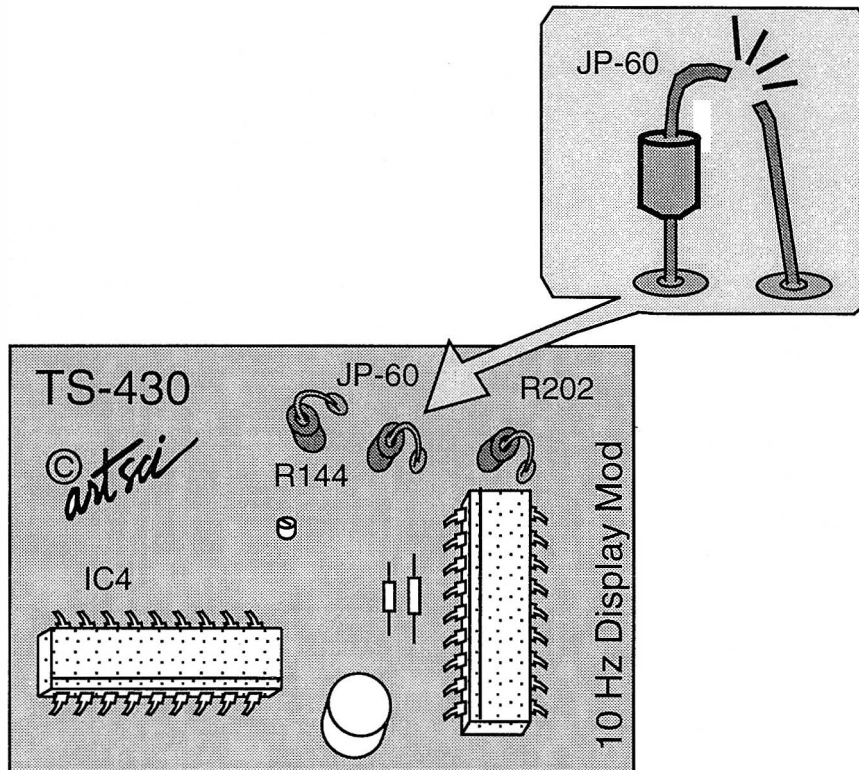
The display will say "-HELLO-"

The CW announcement will please you.



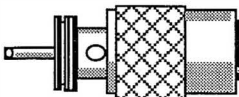
Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from .5 MHz - 30 Mhz



Expanded RF Modification

1. Disconnect the power and antenna.
2. Remove the top and bottom covers from the radio.
3. Locate connector # 10 on the RF circuit board
4. **Cut the two wires that are NOT GREEN.** Leave the Green Wire.
5. Wrap Tape around the ends of the cut wires.
6. Locate CONTROL unit and **cut JP-60** for 10 Hz display. See below
7. Reassemble the radio.
8. RESET the CPU.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci



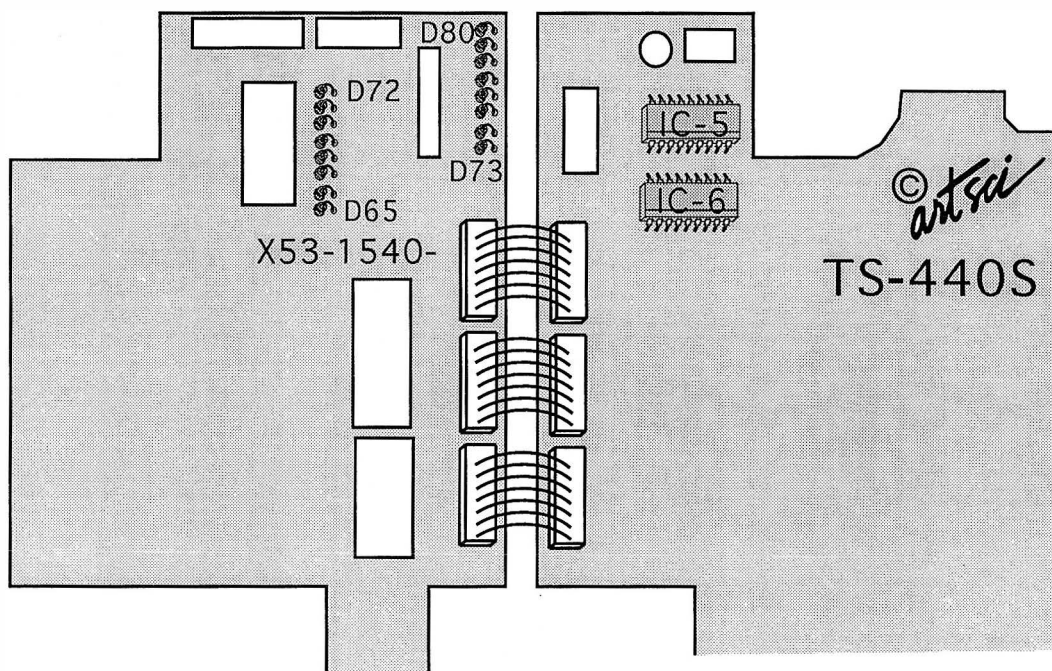
KENWOOD

TS-440S

Receive and Transmit Expansion

Expansion Range

.5 MHz - 30 MHz



Expanded RF Modification

1. Disconnect the Power and antenna.
2. Remove the top and bottom covers from the radio.
3. Remove the Countersunk screws that secure the front panel to the chassis. There are two on each side
4. Gently pull the front panel forwards.
5. Remove the 5 small round head screws that secure the shield plate to the front panel. There are 2 on top and 3 on the bottom.
6. **Remove Diode D80.** D80 is located in the corner near Connector 54.
7. **Cut Diode 66** for 10 Hz resolution. See page 24 of the instruction manual.
8. Reassemble the radio.
9. RESET the CPU. Press and hold [A=B] and turn power on.

Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

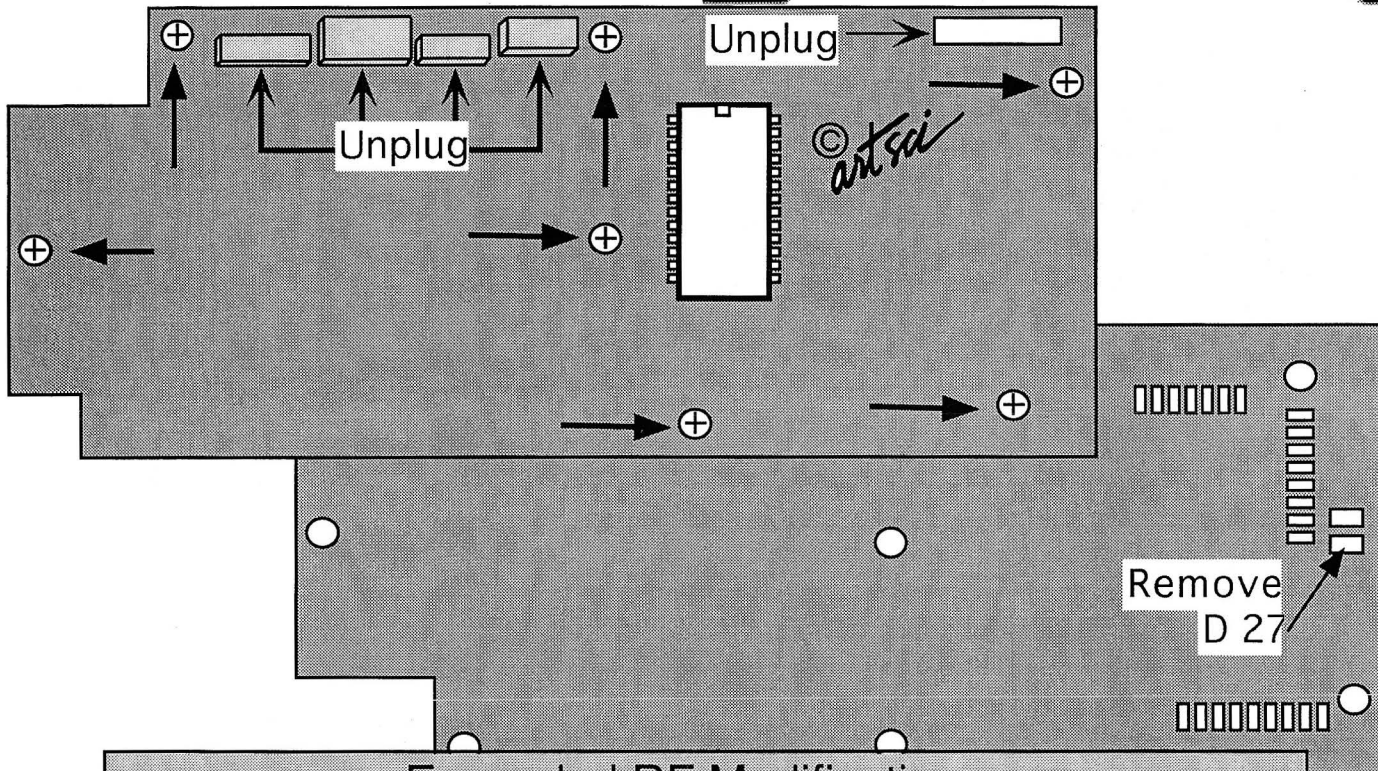
Receive and Transmit Expansion

KENWOOD

TS-450S

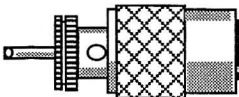
Expansion Range

.5 MHz - 30 Mhz



Expanded RF Modification

1. Disconnect the Power and antenna.
2. Remove the top and bottom covers from the radio. (14 Screws)
3. Remove the top screws (countersunk) from each side of the front panel.
4. Loosen the bottom screws (countersunk) from each side of the front panel.
5. Carefully pull the top front of the front panel forward to expose the Digital board.
6. Remove the seven screws from the digital board.
7. Disconnect the 5 cables from the digital board.
8. Rotate the board towards the front panel to gain access to the back side of the board.
9. Locate and **remove diode D27**. Do not pry up the diode. The traces will rip apart.
10. Reassemble the radio.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations
caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

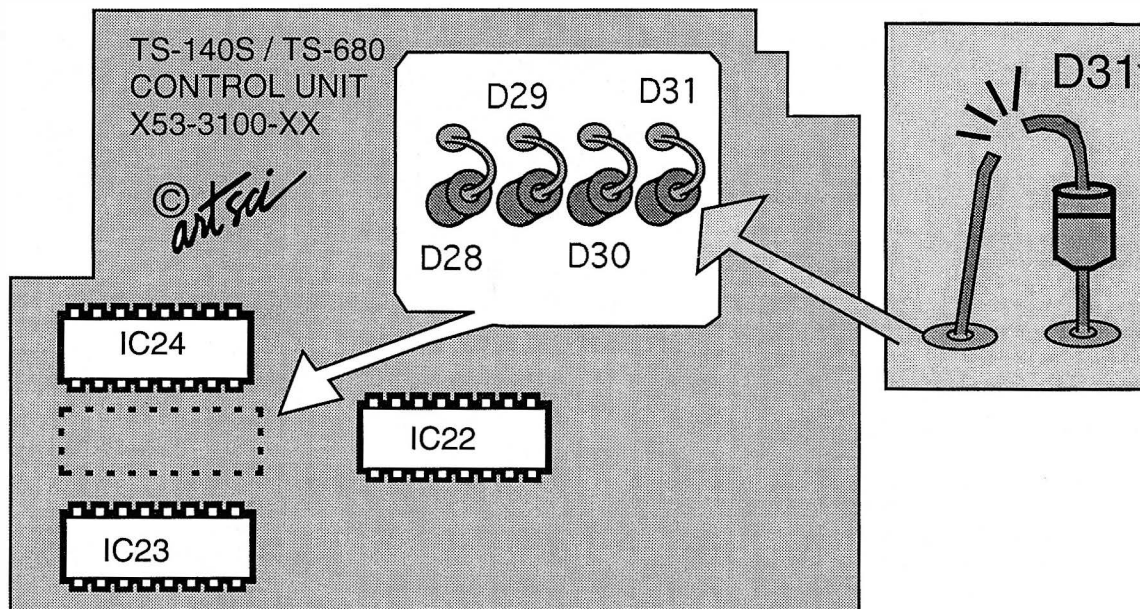
Kenwood - 53

KENWOOD



Expansion Range

The Exact range of this radio is not know as of press time. However most radios expand from .5 Mhz - 30 Mhz .



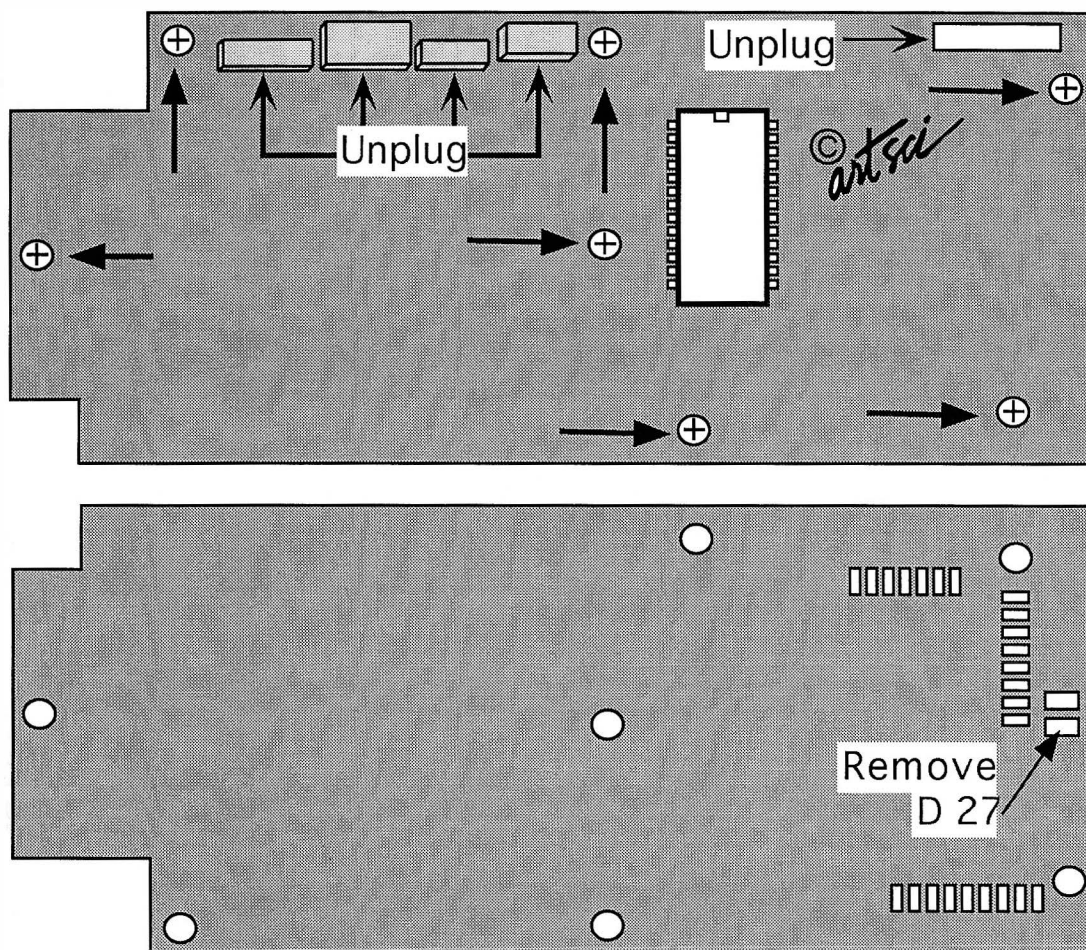
Expanded RF Modification

1. Disconnect the power and antenna.
2. Remove the top and bottom covers from the radio.
3. Locate the Control board on the bottom of the TS-140S
4. **Remove diode D31** on the Control board.
5. Reassemble the radio.
6. RESET the CPU.

Auxiliary Function

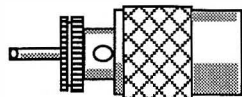
1. Put radio in VFO mode and turn power off.
2. Press and hold [VFO/M] & [LSB/USB] and turn power on.

The display will say "-HELLO-"
The CW announcement will please you.



Expanded RF Modification

1. Disconnect the Power and antenna.
2. Remove the top and bottom covers from the radio. (14 Screws)
3. Remove the top screws (countersunk) from each side of the front panel.
4. Loosen the bottom screws (countersunk) from each side of the front panel.
5. Carefully pull the top front of the front panel forward to expose the Digital board.
6. Remove the seven screws from the digital board.
7. Disconnect the 5 cables from the digital board.
8. Rotate the board towards the front panel to gain access to the back side of the board.
9. Locate and **remove diode D27**. Do not pry up the diode. The traces will rip apart.
10. Reassemble the radio.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
 Have the original book with you when you call with a question. **Use at your own Risk!**
 The Author and all other parties take no responsibility for any damages or violations
 caused by these modifications. Some modifications may violate FCC rules.
 (818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

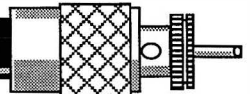
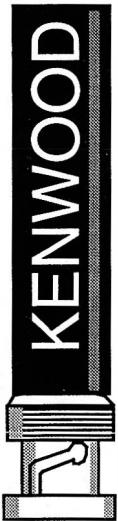


Expansion Range

The Exact range of this radio is not know as of press time.

Expanded RF Modification

- 1 Disconnect the power and antenna.
2. Remove the covers.
4. **REMOVE D30**
5. Reassemble the radio.
6. RESET the CPU.

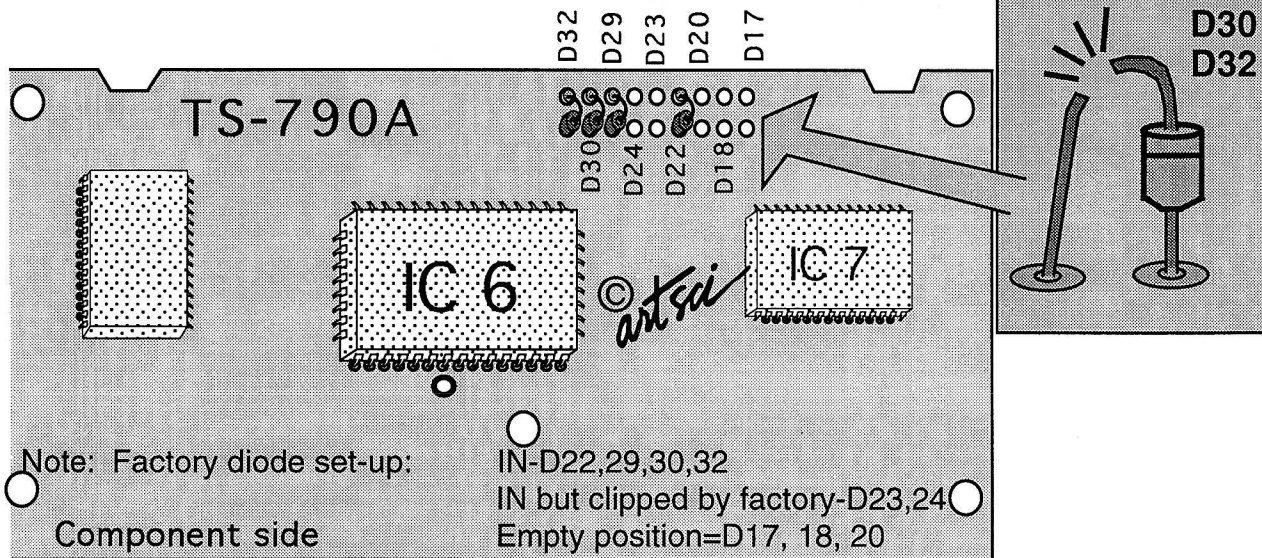


Receive and Transmit Expansion

KENWOOD
TS-790A

Expansion Range

TX: 142-152 MHz
RX: 140-168 MHz, 340-373 MHz,
425-458 MHz, 840-905 MHz,
(1230-1305 MHz with optional
UT-10)



Expanded RF Modification

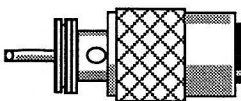
1. Disconnect the power and antenna.
2. Remove the top and bottom cover (14 screws).
3. Locate circuit board positioned vertically behind the front panel.
4. Locate and **remove diodes D29 & D30**.
5. Locate and **remove diode D32**. (X-Band mod)
5. Reassemble radio
6. Reset the microprocessor. (Press and hold [A=B] and turn power on)

Cross Band Repeater Instructions

X-Band ON/OFF - [F] and then [M.IN]

(A Star will appear on the display when on)

Reports state X-BAND works in all modes.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

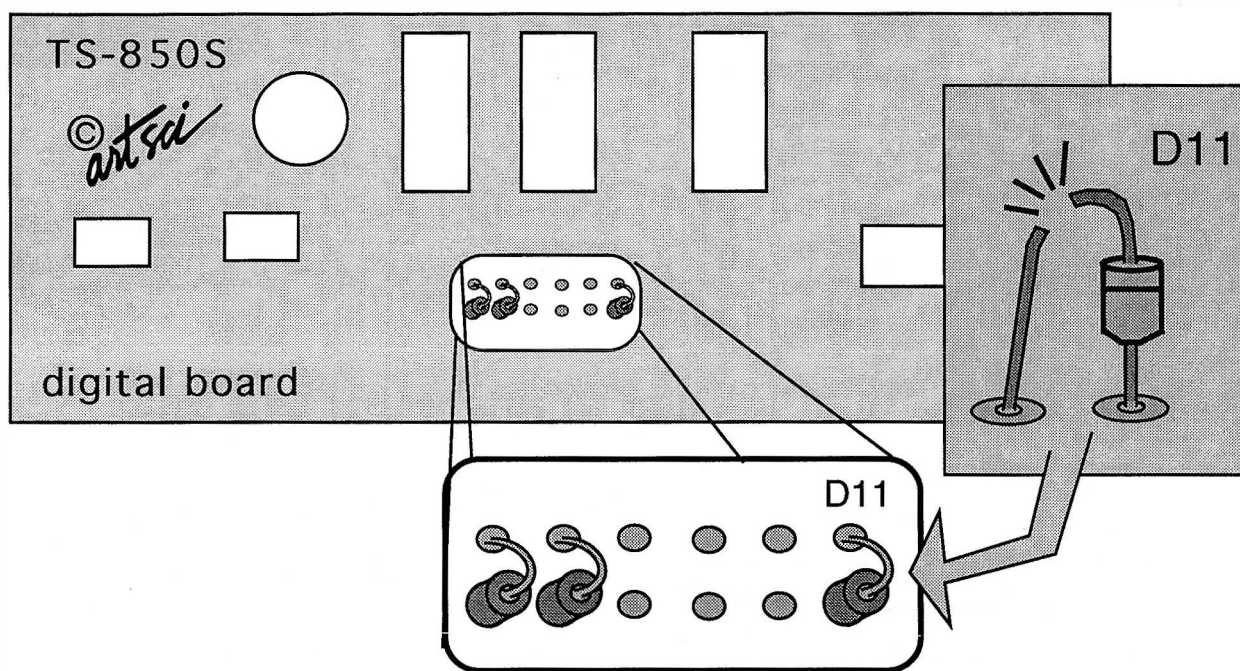
© artsci

Kenwood - 57

KENWOOD

Expansion Range

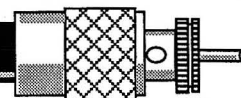
The Exact range of this radio is not know as of press time.



Expanded RF Modification

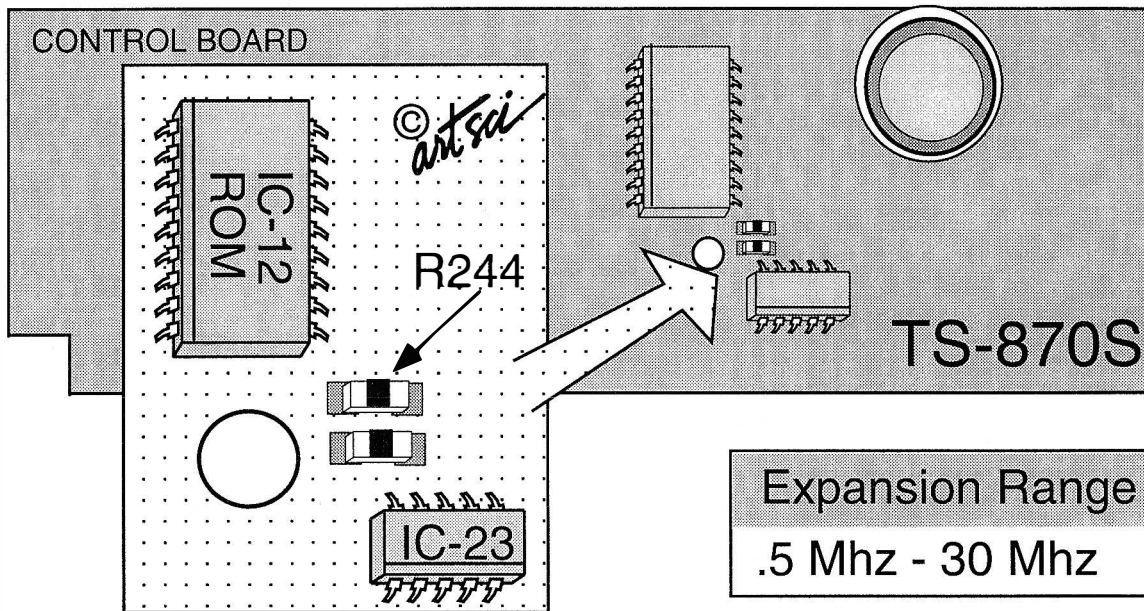
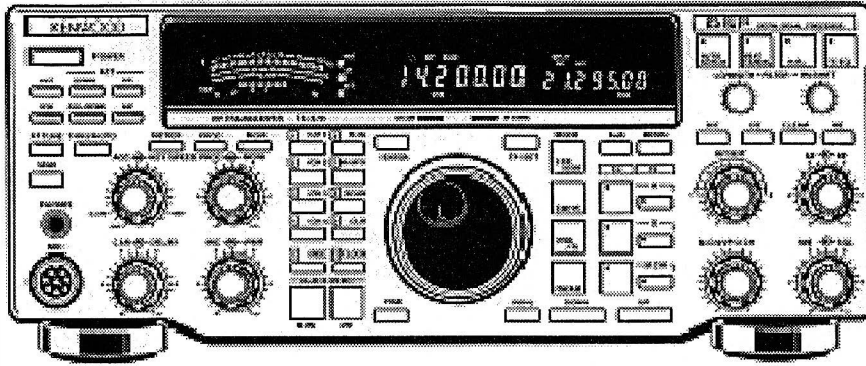
1. Disconnect the power and antenna.
2. Remove the 16 screws top and bottom covers from the radio. Be careful not to break the speaker wires.
3. Remove the top and bottom screws from each side of the front panel assembly.
4. Pull the front panel forward to expose the Digital board.
5. Locate and **cut the lead from diode D11.**
6. Reassemble the radio.
7. **Reset the microprocessor** (Holding the [A=B] Key while turning the power on.)

Radio/Tech Modifications Volume A



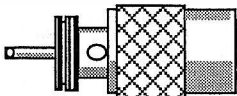
©artsci

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
 Have the original book with you when you call with a question. **Use at your own Risk!**
 The Author and all other parties take no responsibility for any damages or violations
 caused by these modifications. Some modifications may violate FCC rules.
 (818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com



Expanded RF Modification

1. Remove power and antenna.
2. Remove top and bottom covers.
3. Remove the top screw from each side of the front panel.
4. Loosen the two bottom screws on the front panel.
5. Carefully rotate the front panel to gain access to the CONTROL BOARD.
(This is the board mounted vertically on the body of the radio not the board on the front panel)
6. Locate and **remove resistor R-244** on the control board.
7. Reassemble the radio.
8. Reset the microprocessor (Press and hold [A=B] and turn power on)

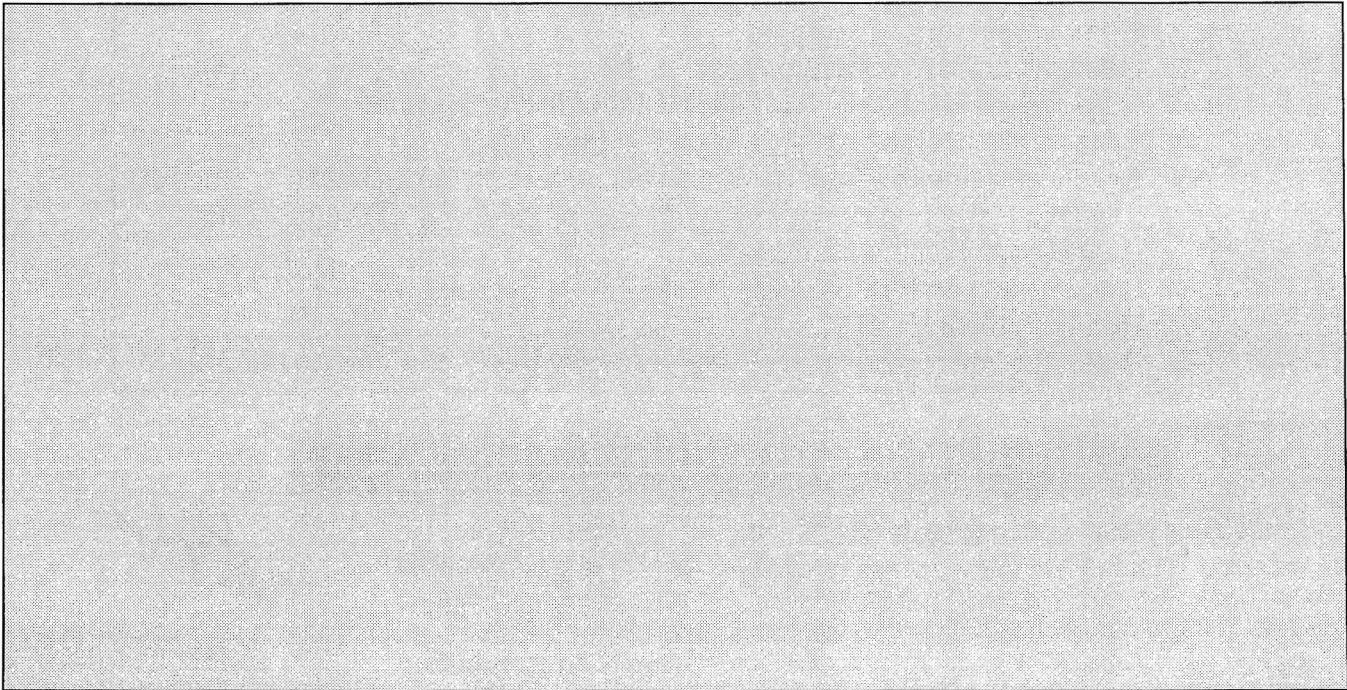


Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations
caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

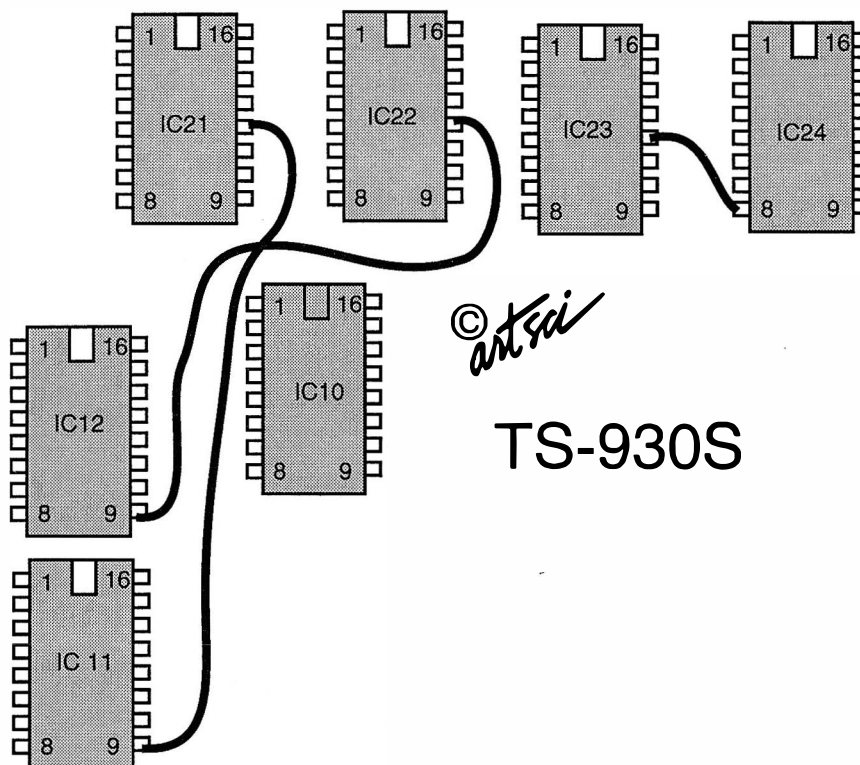
© artsci

Lined area for notes.



Expansion Range

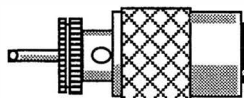
.5 Mhz - 30 Mhz



TS-930S

Expanded RF Modification

1. Disconnect the power and antenna.
 2. Remove the top and bottom covers from the radio.
 3. Remove the four screws from the speaker mounting and the top panel Assembly.
 4. Swing the assembly away and unplug the Red/Black battery leads from the Digital unit X54-1680-00.
 5. **Solder wires between the following locations:**
 - IC 21 Pin 12 to IC 11 Pin 9
 - IC 22 Pin 12 to IC 12 Pin 9
 - IC 23 Pin 12 to IC 24 Pin 8
- Tack-solder on the component side of the board is OK
5. Reassemble the radio.



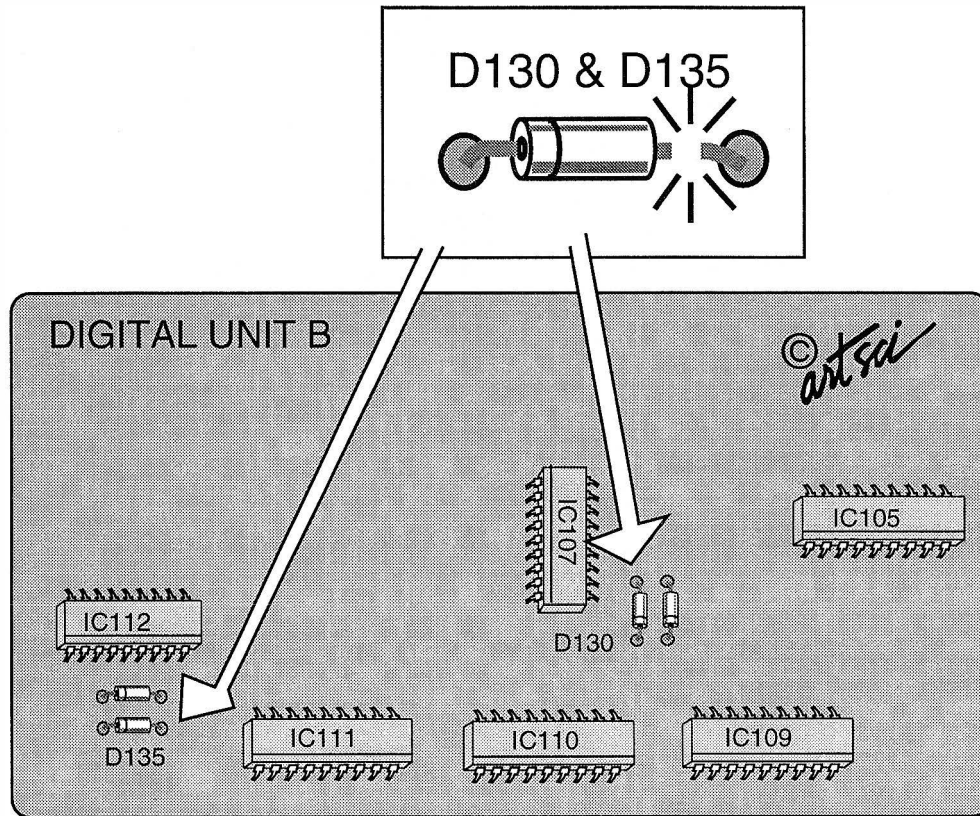
Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
 Have the original book with you when you call with a question. **Use at your own Risk!**
 The Author and all other parties take no responsibility for any damages or violations
 caused by these modifications. Some modifications may violate FCC rules.
 (818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

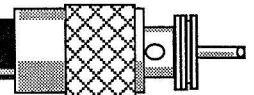
Expansion Range

.5 Mhz - 30 Mhz



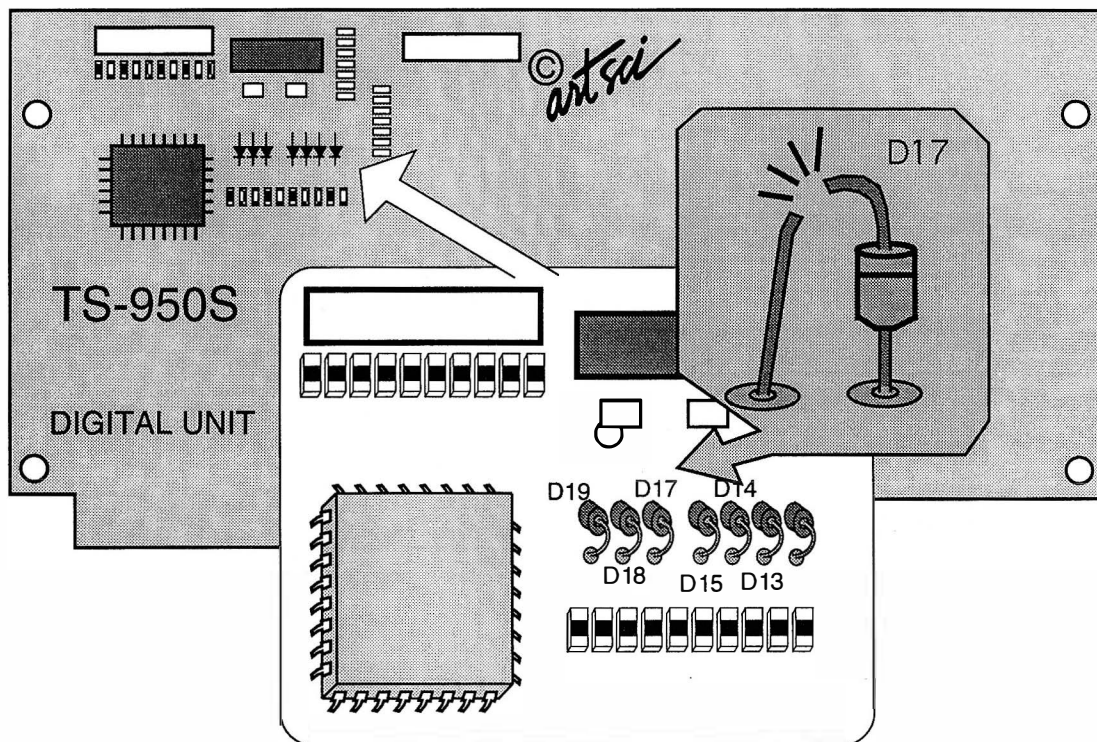
Expanded RF Modification

1. Disconnect the power and antenna.
2. Remove case screws and case.
3. Locate Digital Unit B. This is the board that is in the enclosure where the VS-1 is mounted. Digital Unit B is the board closest to the Front Panel.
4. **Cut Diodes D130 & D135.** Located near IC-109.
5. Reassemble the radio
6. Reset the microprocessor
(Turn the radio on, Press and Hold the [A=B] Switch and turn off and back on the radio.)



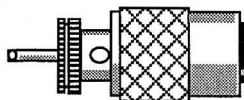
Expansion Range

.5 MHz - 30 Mhz



Expanded RF Modification

1. Remove power and antenna.
2. Remove the top and bottom covers
3. Locate the Digital Unit.
4. **Cut diode D-17**
5. Reassemble the Radio
6. Reset the Microprocessor. (Press and hold [A=B] and turn power on.)

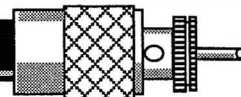


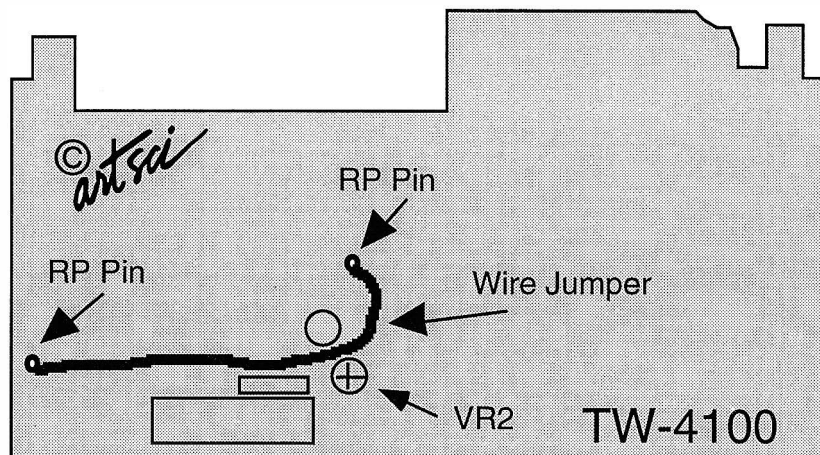
Expansion Range

The Exact range of this radio is not know as of press time.

Expanded RF Modification

1. Remove Power and Antenna.
2. Open the radio.
3. Locate the RX Circuit board.
4. Locate and **cut Diodes D32 and D33.** (Located near the DTMF IC)
5. Reassemble the radio.
6. **Reset the Microprocessor.**





Expanded RF Modification

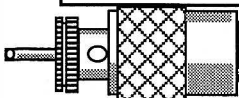
1. Remove power and antenna.
2. Remove 4 screws securing the top cover.
3. Remove 10 screws securing the bottom cover.
4. **Solder a wire jumper connecting the two RP Pins.** (see drawing)
5. Reassemble the radio.

Cross Band Repeater Modification

The VFO and a Memory channel (except 8 & 9) must be used. Select the proper frequencies, offsets & tone. (VFO simplex operation must use DUP with a 0 offset.)

TURN ON - Enter frequencies in a memory and VFO and press [Shift].
Turn power off. Press and hold [REV] and turn radio on.

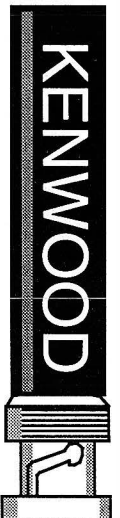
TURN OFF - Turn Power off.

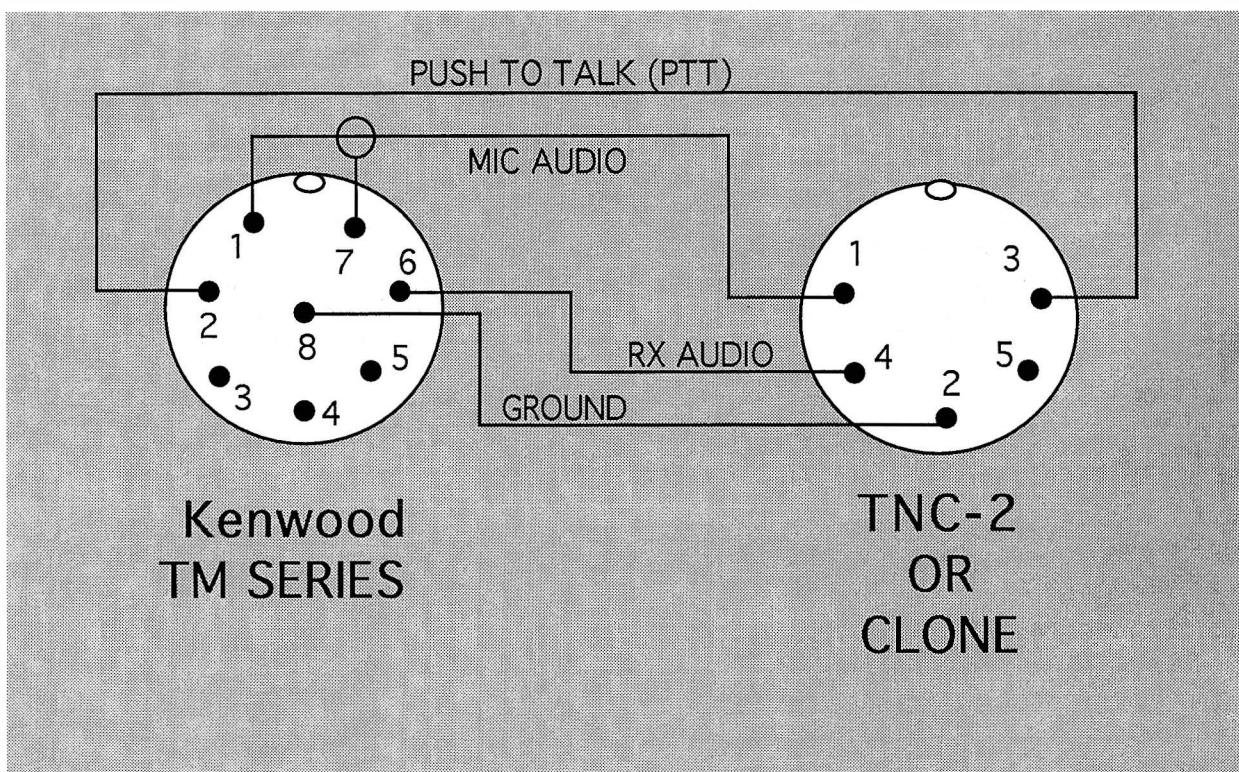


Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci





Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

© artsci

SCANNER MODIFICATIONS

Radio	Modification	Page #
-------	--------------	--------

AOR

AOR-1500	Expanded RF.....	Scanners - 2
AOR-8000	Expanded RF.....	Scanners - 2

UNIDEN

BC-140	Expanded RF.....	UNIDEN - 26
BC-200	Expanded RF & Battery Life Extender.....	UNIDEN - 27
BC-205	Expanded RF.....	UNIDEN - 28
BC-700	Expanded RF.....	UNIDEN - 29
BC-760	Expanded RF for older models.....	UNIDEN - 30
BC-760	Expanded RF for newer models.....	UNIDEN - 31
BC-855	Expanded RF for older models.....	UNIDEN - 32
BC-855	Expanded RF for newer models.....	UNIDEN - 33
BC-890	Expanded RF.....	UNIDEN - 34
BC-950	Expanded RF for older models.....	UNIDEN - 35
BC-950	Expanded RF for newer models.....	UNIDEN - 36
BC-2500	Expanded RF.....	UNIDEN - 37
MR-8100	Expanded RF.....	UNIDEN - 38

REGENCY

R-1600	Expanded RF for older models.....	REGENCY - 23
R-1600	Expanded RF for newer models.....	REGENCY - 22
R-4030	Expanded RF & Battery Life Extender.....	REGENCY - 25

RADIO SHACK

PRO-23	Expanded RF.....	Radio Shack - 3
PRO-33	Expanded RF.....	Radio Shack - 4
PRO-34	Expanded RF.....	Radio Shack - 5
PRO-37	Expanded RF.....	Radio Shack - 6
PRO-39	Expanded RF.....	Radio Shack - 7
PRO-43	Expanded RF.....	Radio Shack - 8
PRO-46	Expanded RF.....	Radio Shack - 9
PRO-50	Expanded RF.....	Radio Shack - 10
PRO-51	Expanded RF.....	Radio Shack - 12
PRO-2004	Expanded RF/More memories/Speed Increase..	Radio Shack - 13
PRO-2005	Expanded RF.....	Radio Shack - 14
PRO-2006	Expanded RF.....	Radio Shack - 15
PRO-2021	Expanded RF.....	Radio Shack - 16
PRO-2022	Expanded RF.....	Radio Shack - 17
PRO-2026	Expanded RF.....	Radio Shack - 18
PRO-2027	Expanded RF.....	Radio Shack - 19
PRO-2030	Expanded RF.....	Radio Shack - 20
PRO-2032	Expanded RF.....	Radio Shack - 21
PRO-2035	Expanded RF.....	Radio Shack - 21
PRO-2042	Expanded RF.....	Radio Shack - 21

SCANNERS

AOR

AR-1500

800 Mhz Restoration

Expanded RF Modification

1. Locate and set RESET Switch to the ON position.
2. Turn the Power on
3. Turn the RESET Switch OFF.
4. Press [PROG] [0] [.] [5] [LIMIT] [9] [5] [.] [9] [9] [5] [SEARCH] [5] [5] [6] [.] [3] [2] [5] [ENTER]
5. Press [PROG] [9] [6] [LIMIT] [2] [9] [9] [.] [9] [9] [5] [SEARCH] [5] [5] [6] [.] [3] [2] [5] [ENTER]
6. Press [PROG] [3] [0] [0] [LIMIT] [5] [1] [2] [.] [9] [9] [5] [SEARCH] [2] [4] [9] [.] [1] [2] [5] [ENTER]
7. Press [PROG] [5] [1] [3] [LIMIT] [7] [9] [7] [.] [9] [9] [5] [SEARCH] [5] [8] [.] [0] [7] [5] [ENTER]
8. Press [PROG] [7] [9] [8] [LIMIT] [1] [1] [0] [5] [.] [9] [9] [5] [DOWN] [2] [4] [9] [.] [1] [2] [5] [ENTER]
9. Press [PROG] [1] [1] [0] [6] [LIMIT] [1] [3] [0] [0] [DOWN] [5] [5] [6] [.] [3] [2] [5] [ENTER]

AOR

AR-8000

800 Mhz Restoration

Expanded RF Modification

1. Press [FUNC] then [LOCAL]. Set the radio to the EXPERT mode.
2. Press [Down Arrow] until you reach the REMOTE setting.
Set BPS to 9600.
3. Press [Down Arrow] to access the DELI mode.
Set to CR ONLY.
Press [RETURN]
4. Press [FUNCTION] then [0] to access the SET COPY mode.
Press [Down Arrow] to access SEND/RECEIVE mode.
Set RCV mode
5. Press [Down Arrow] to access ALL-DATA mode.
Switch to SYS-DATA.
6. Insert the interface unit into the radio to accept the Scancat commands.
7. In the first main directory, Select "R"
8. In the Radio Select pop-up menu, enter "D" (AOR-8000)
9. In the main directory, Select "B".
10. In the Disk File Utilities, Select "A".
11. In the AOR-8000 Directory select 5.
12. In the next directory choose COM Port #1, then "C"
13. Follow the instructions at the bottom of the screen to load the program.
After 2-3 minutes, the display will signal it is finished loading.
14. Disconnect the interface.
14. Press [CLEAR]. and return to 2 VFO mode.

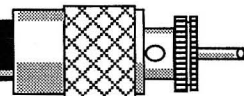
Expansion Range

806 MHz - 956 MHz

Modification requires
an :

the AOR optional
computer interface &
Scan cat Gold.

Radio/Tech Modifications Volume A



Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations
caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

Expansion Range

The Exact range of this scanner is not know as of press time. However most scanners will cover the the entire 800-900 MHz range after a modification.

Expanded RF Modification

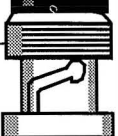
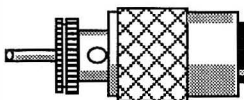
Keyboard only modification!!!

1. Press and hold [2] & [9] & [LOCKOUT] & turn the radio on.
2. Step to channel 15 to display 888.960 MHz (a factory test frequency)
3. Press [UP] or [DOWN] search arrow to scan the band.
You may store up to 10 active frequencies by pressing [MONITOR].

See the test mode instructions in the PRO-51 section of this book. New models may require those steps.

TO STORE A SELECTED FREQUENCY FOR SCANNING (SEARCH STARTING POINT)

1. Step to the Monitor channel you wish to store.
2. Press [PROGRAM] & the desired memory channel number.
3. Press [PROGRAM], [MONITOR] [ENTER].

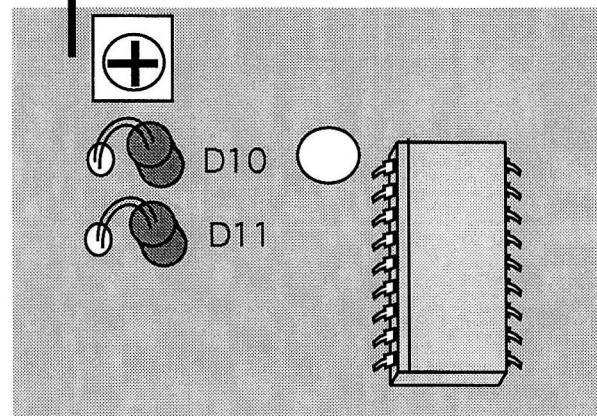
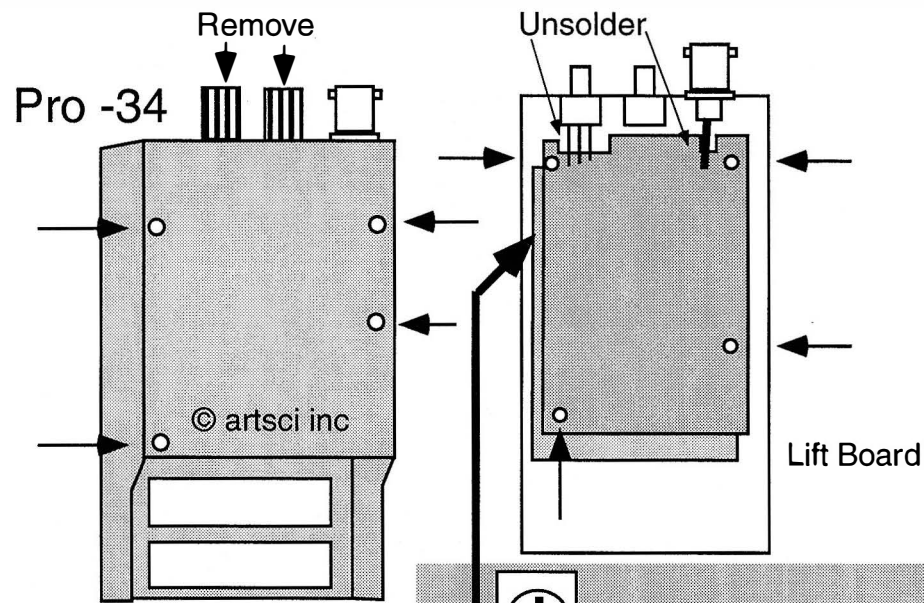


Expansion Range

The Exact range of this scanner is not know as of press time. However most scanners will cover the the entire 800-900 MHz range after a modification.

Expanded RF Modification

1. Remove Power and Antenna.
2. Remove screws from the case
3. Locate LOGIC circuit board.
4. Locate and **cut Diode D11**
5. Reassemble the radio.



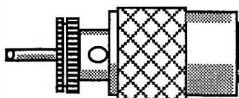
Expansion Range

The Exact range of this scanner is not know as of press time. However most scanners will cover the the entire 800-900 MHz range after a modification.

Expanded RF Modification

1. Remove battery and Antenna.
2. Remove 4 screws from the case.
3. Remove Volume and Squelch Knobs.
4. Unsnap and remove back cover.
5. Remove 4 hex screws holding top board.
6. Unsolder the BNC center pin & two wires on volume control.
An additional ground wire on bottom of board to metal shield may need to be removed.
7. Unplug circuit board and move away.
8. Remove 3 screws on metal cover place and remove.
9. Locate and **cut Diode D11** on Logic board.
5. Reassemble the radio.

One report states that the 30-52 MHz band is lost after this modification.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

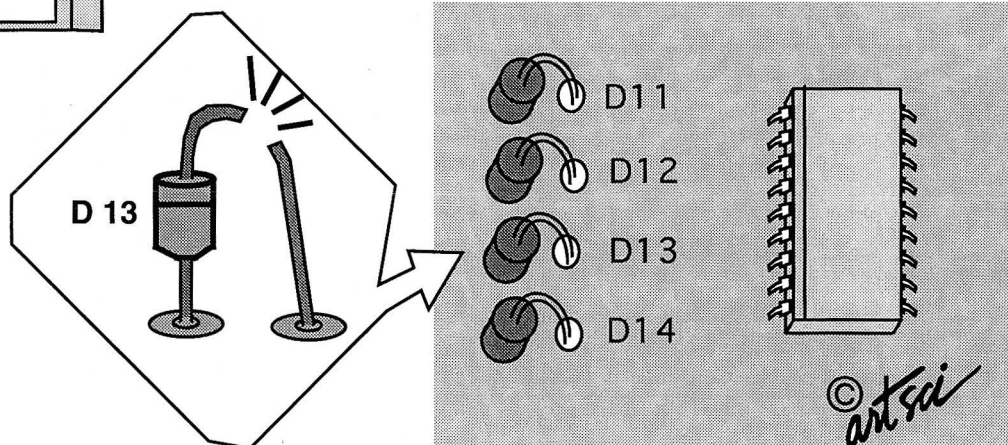
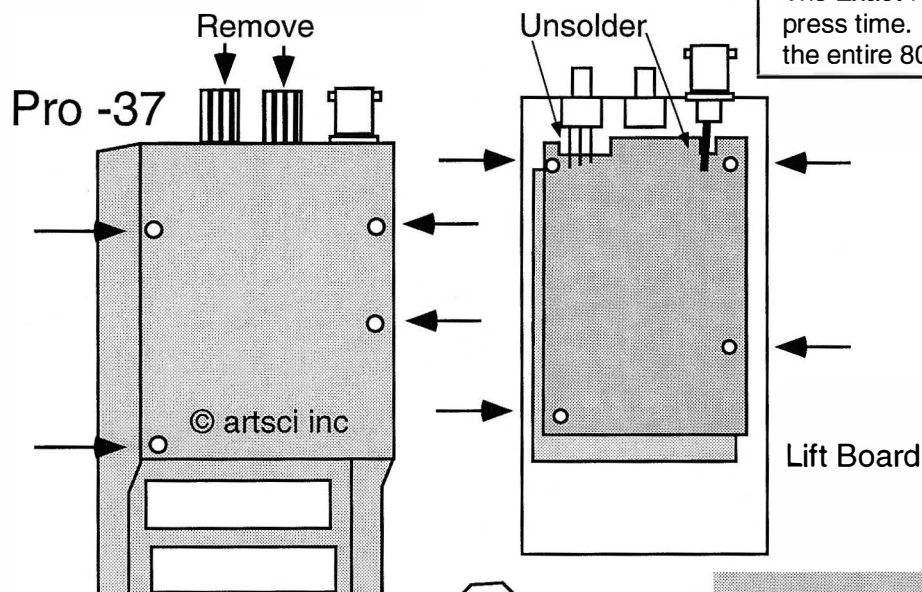
Radio Shack - 5

SCANNERS



Expansion Range

The Exact range of this scanner is not know as of press time. However most scanners will cover the the entire 800-900 MHz range after a modification.



Expanded RF Modification

1. Remove batteries and Antenna.
2. Remove Knobs.
3. Remove the 4 body screws.
4. Slide Case off. (over Vol. & Squelch posts)
5. Unsolder BNC Connector. You may wish to unsolder the 3 wires to the control pot.
6. Unscrew 4" Hex/Nuts Posts" holding upper board.
7. Unplug upper board.
8. Remove 3 shield screws and lift the shield.
9. **Clip Diode D13.**
10. Reassemble the radio.

Expansion Range

The Exact range of this scanner is not know as of press time. However most scanners will cover the the entire 800-900 MHz range after a modification.

Expanded RF Modification

1. Remove batteries and Antenna.
2. Remove 4 screws from the back of the scanner.
3. Carefully lift the scanners back cover off.
4. Unplug the 2 wire harness.
5. Remove the 6 screws holding the circuit board in place.
6. Unsolder the ground wire at the bottom of the board.
7. Unsolder the BNC connector.
8. Lift the board and set it aside.
9. Remove the two screws holding the next circuit board.
10. Unplug the 2 wire connector.
11. Lift the board and set it aside.
12. Unsolder the shield and set it aside.
13. Locate and **remove chip diode D6**.
14. Reassemble the scanner.

Information on other Diode functions

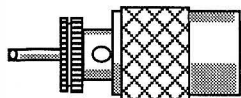
(install to enable) :

D4 - Enable 68-88 MHz coverage (lose 30-54 MHz coverage)

D5 - Enables 800 MHz operation

D7 - Enable 12.5 kHz spacing. (Not good for cellular)

This information is provided for those tech who must know the function of the other Diodes.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

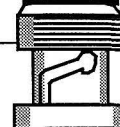
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

Radio Shack - 7

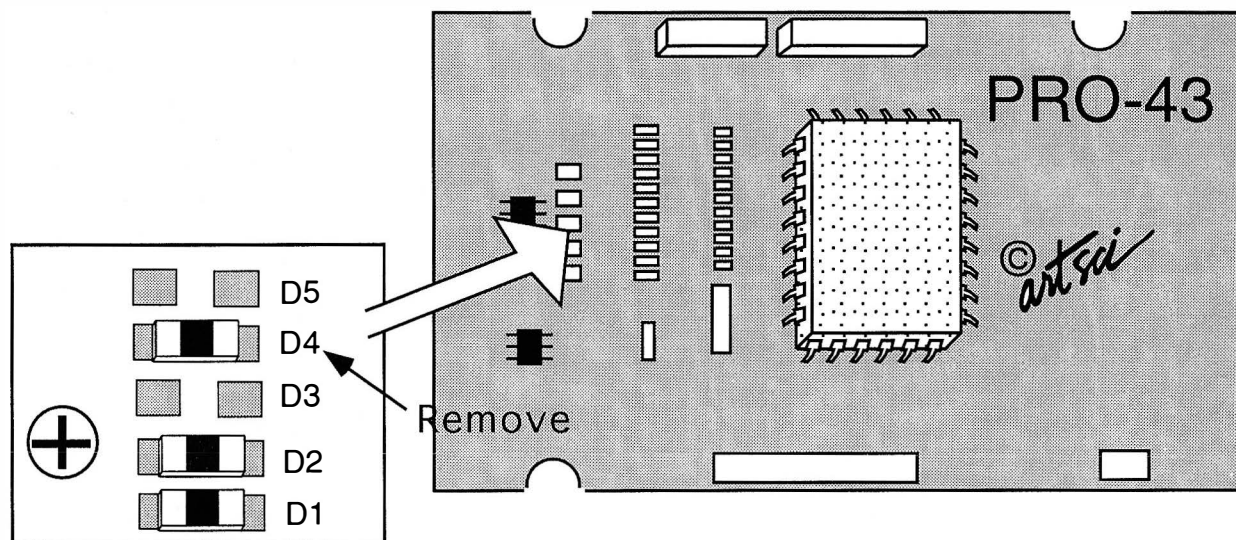
SCANNERS



Expansion Range

The Exact range of this scanner is not know as of press time. However most scanners will cover the the entire 800-900 MHz range after a modification.

This modification will not work on scanners that were produced after the FCC Scanner law of 1994. Reports show that some units with Serial numbers starting with an "A" have a new microprocessor and that Diode D4 is not present. As of press time no new modification is available for these scanners. Use the Phone Support form in the back of this book to request any updates that may become available.



Expanded RF Modification

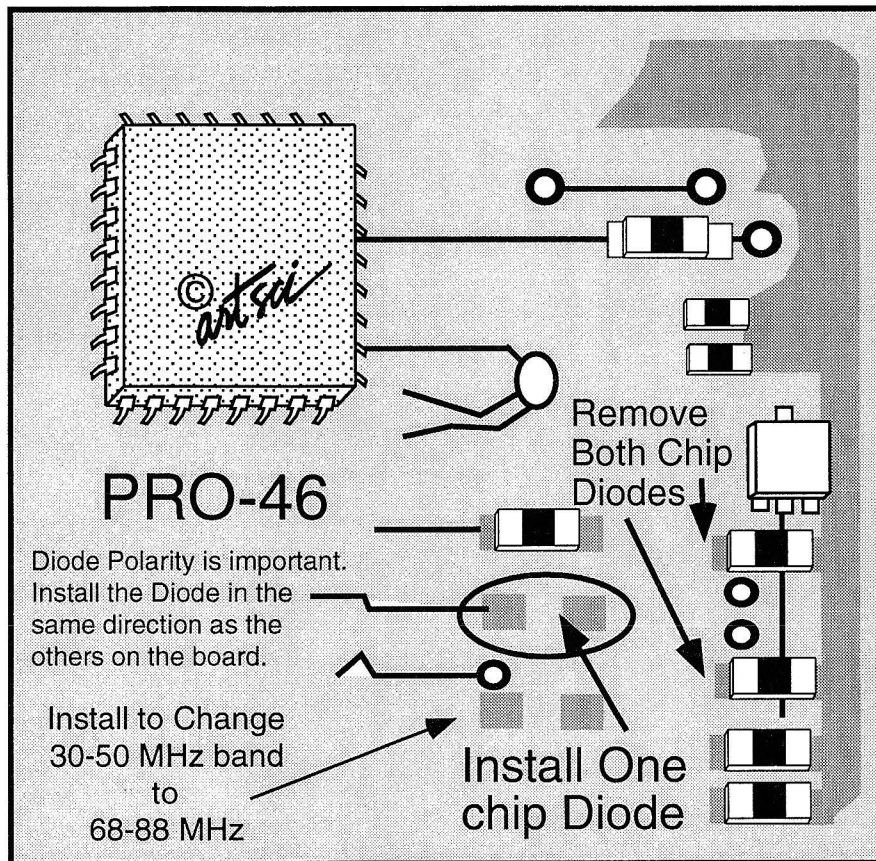
1. Remove battery and Antenna.
2. Remove the four screws from the back case & gently remove the case.
3. Unsolder the BNC connector from the top board.
4. Remove six screws from the top board.
5. Disconnect the two connectors near the shielded area.
6. Gently lift the top board and set it aside.
7. Remove the two screws securing the middle board.
8. Lift the board and set it aside. (Do not disconnect it from the bottom board.)
9. Unsolder the four corners of the shield and remove it.
10. Locate the surface diodes under the CPU.
11. Locate and **remove Diode D4**. Do not crush the part. Unsolder and remove it.
12. Reassemble the radio.

NOTE: PLACING A DIODE IN POSITION D3 MAY INCREASE LOW BAND COVERAGE FROM 54 TO 88 MHz

Memory clear : Press and Hold [0], [CLEAR] key and turn on

Expansion Range

The Exact range of this scanner is not know as of press time. However most scanners will cover the the entire 800-900 MHz range after a modification.



Modification

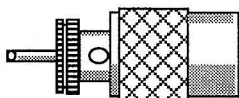
Serial Number 4500 & above

1. Remove battery and Antenna.
2. Remove back cover.
3. Unplug the upper board from the lower board.
4. Unsolder the copper/Plastic shield from the microprocessor.
5. Locate circuit board attached to the microprocessor.
6. Cut all five wires on this board.
7. Reassemble the radio.
8. Press and hold [2], [9] & [LOCKOUT] and turn radio on.
9. Select channel 23.
10. Use [up] & [Down] button to scan the band.

SEE TEST MODE Instructions in the Pro 51 sheet

Expanded RF Modification

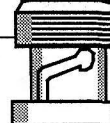
1. Remove battery and Antenna.
2. Remove the four screws from the back case & gently remove the case.
3. Unplug the upper board from the lower board.
4. Unsolder the copper/Plastic shield from the microprocessor.
5. Locate and **remove the two chip Diodes**. (see drawing)
6. Solder **install one of the chip Diodes** as shown. (upper pad)
7. Reassemble the radio.



Radio/Tech Modifications Volume A

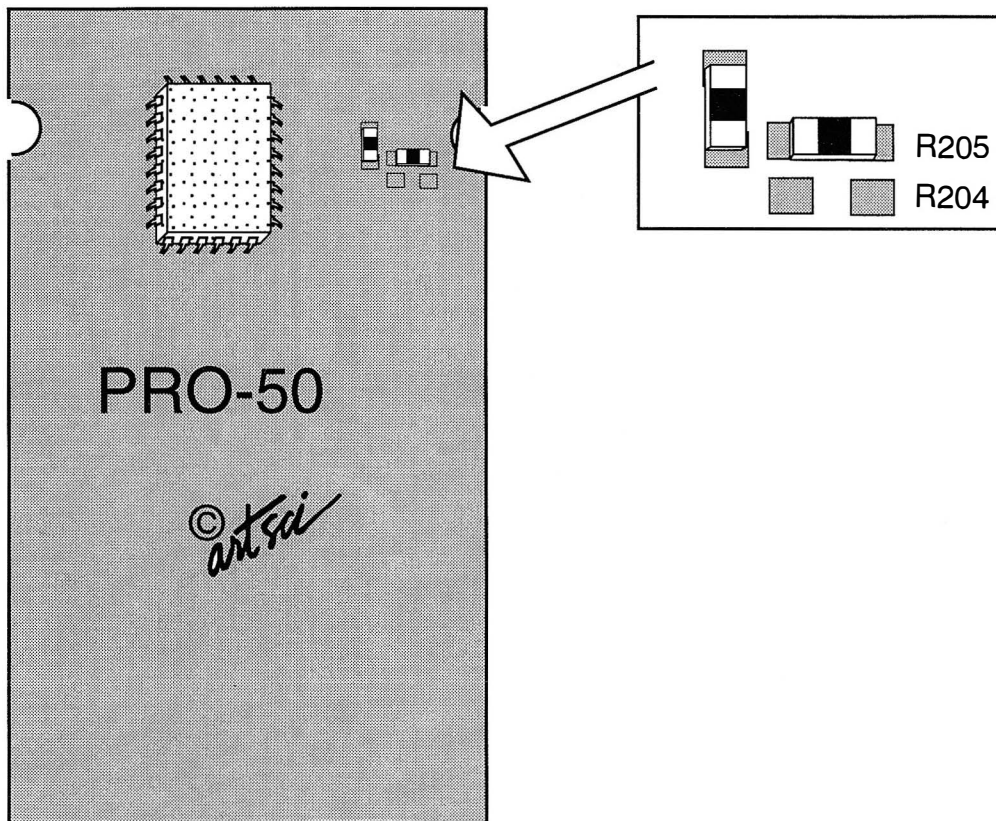
Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

artsci



Expansion Range

69 -88 Mhz receive in place of 30-54 MHz



Expanded RF Modification

1. Remove battery and Antenna.
2. Remove the four screws from the back case & gently remove the case.
3. Unsolder the BNC connector from the top board.
4. Unplug the circuit board.
5. Locate and **remove Resistor R-204.**
6. Please the resistor in R-205 position
7. Reassemble the radio.

Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

Radio/Tech Modifications

Frequency report

[illegible]

Expansion Range

The Exact range of this scanner is not know as of press time. However most scanners will cover the the entire 800-900 MHz range after a modification.

This modification will not work on scanners that were produced after the FCC Scanner law of 1994. Reports show that units with serial numbers starting with the 4500 or 8A4 (August 1994) series have a new microprocessor. As of press time no new modification is available for these scanners. Use the Phone Support form in the back of this book to request any updates that may become available.

Test Modes

Mode 0 - Clear all memories - Press [2] & [9] & Turn on.

Mode 1 - Fill channels 1-25 with test Freqs - Press [2] & [9] & [L/OUT] & Turn on.

Mode 2 - Fill channels 1-17 with test Freqs - Press [2] & [9] & [MANUAL] & Turn on.

Mode 3 - Display Test - Press [2] & [9] & [BAND] & Turn on.

Memory mode 1 will fill channel 23 with 860 MHz.

1. Open the squelch on channel 23
2. Press [Direct Search] button
3. Press [Monitor] button
4. You can now store the frequency in any other memory channel.

** On new models you may need to select mode 1 immedially after starting Mode 3.

Expanded RF Modification

Keyboard only modification!!!

1. Press and hold [2] & [9] & [LOCKOUT] & turn the radio on.
2. Step to channel 23 to display 888.960 MHz (a factory test frequency)
3. Press [UP] or [DOWN] search arrow to scan the band.
You may store up to 10 active frequencies by pressing [MONITOR].

TO STORE A SELECTED FREQUENCY FOR SCANNING (SEARCH STARTING POINT)

1. Step to the Monitor channel you wish to store.
2. Press [PROGRAM] & the desired memory channel number.
3. Press [PROGRAM], [MONITOR] [ENTER].

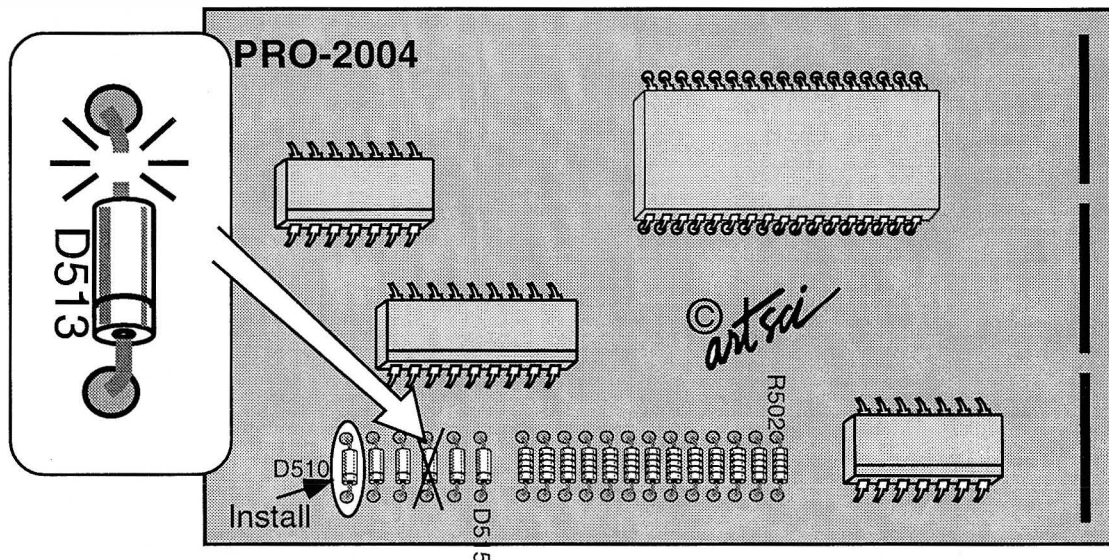
800 MHz Restoration

100 additional memory channels

Radio Shack
PRO-2004

Expansion Range

The Exact range of this scanner is not know as of press time. However most scanners will cover the the entire 800-900 MHz range after a modification.

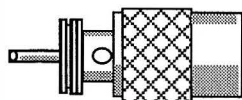


Expanded RF Modification

1. Remove Power and Antenna.
2. Remove 4 screws from the case and slide the case off.
3. Locate circuit board PC-3
4. Remove metal cover on top side of PC-3
5. **Cut Diode D-513** (800 MHz Mod)
6. **Add a 1N914 or 1N4148 Diode in position D-510.** (for 400 memories)
Note: Radio Shack part # 276-1122.
Note: Diode locations D-510 and D-511 are not labeled
7. Replace metal cover
8. Reassemble radio.

Other Diode Functions

D-510 Add for 400 memories
D-512 Remove for 12.5 kHz Stepping. (leave in for 30 kHz)
D-513 Remove for 800 Band Receive.
D-514 Add to increase scanning speed to 20 Channels per second



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

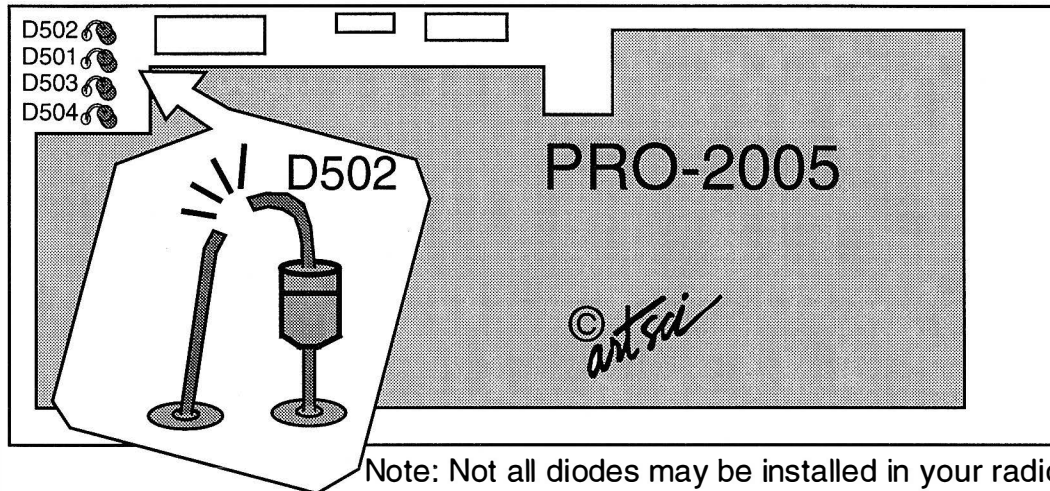
© artsci

Radio Shack - 13

SCANNERS

Expansion Range

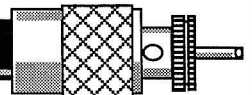
The Exact range of this scanner is not known as of press time. However most scanners will cover the the entire 800-900 MHz range after a modification.



Note: Not all diodes may be installed in your radio.
The above picture shows all diodes for reference only

Expanded RF Modification

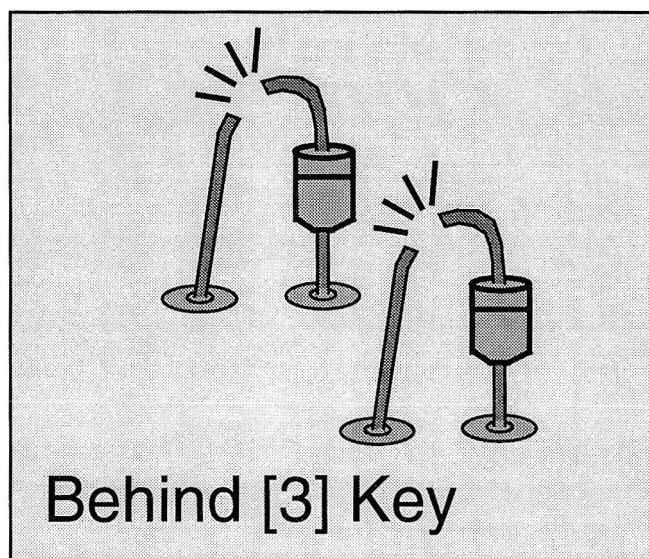
1. Remove Power and Antenna.
2. Remove 4 screws from the back case.
3. Remove 4 screws on the front panel & unplug the speaker.
4. Locate Diode D502. It is located behind the number 3 key on the keypad.
5. **Cut the exposed lead of D502** and push the ends apart.
6. **Install a Diode** in the empty location D-501. (Speed Increase)
7. Reassemble the radio.



Expansion Range

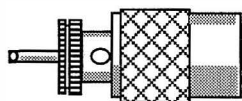
The Exact range of this scanner is not known as of press time. However most scanners will cover the the entire 800-900 MHz range after a modification.

This modification will not work on scanners that were produced after the FCC Scanner law of 1994. Reports show that units with serial numbers starting with the 4500 series have a new microprocessor. As of press time no new modification is available for these scanners. Use the Phone Support form in the back of this book to request any updates that may become available.



Expanded RF Modification

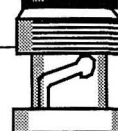
1. Remove screws and the top cover.
2. Locate the two diodes behind the [3] key.
3. **Cut Diode D-502** (800 MHz Modification)
4. **Cut Diode D-503** (Scanning speed increase)
5. Reassemble the radio.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci



Radio/Tech Modifications

Frequency report

[illegible]

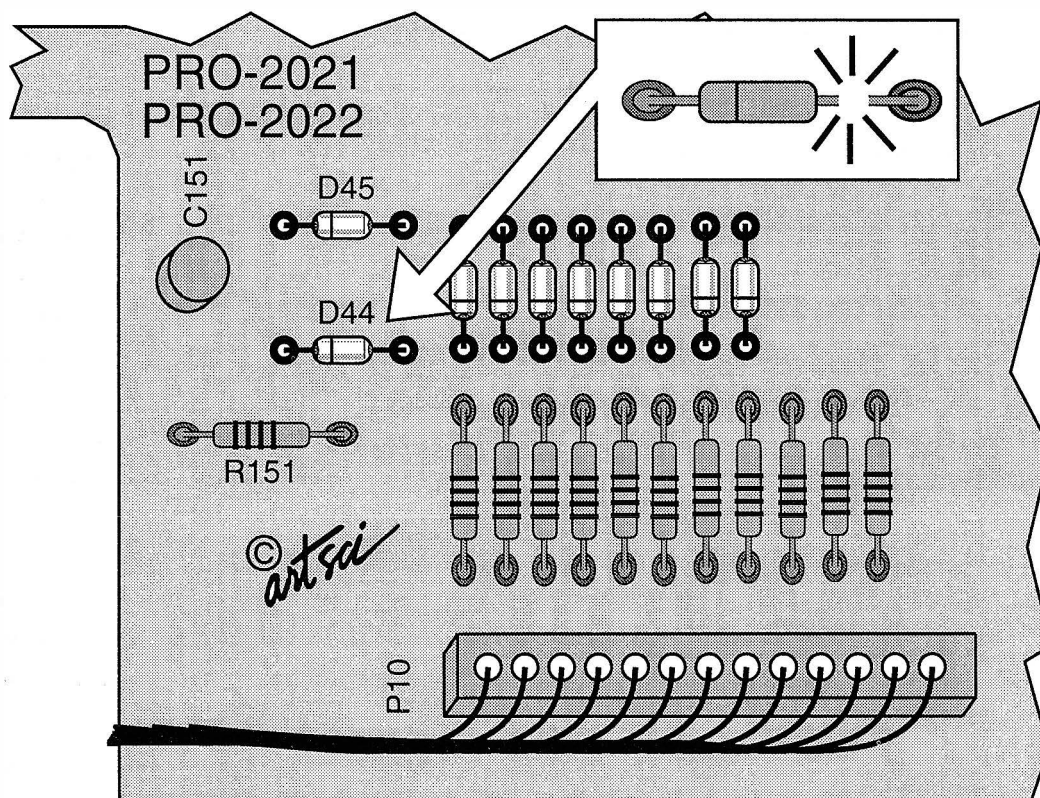
800 MHz Restoration Scan Speed Increase

Radio Shack

PRO-2021
PRO-2022

Expansion Range

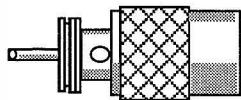
806 MHz - 960 MHz



Expanded RF Modification

1. Remove Power and Antenna.
2. Remove screws from the case
3. Locate and **cut Diode D44**. (On microprocessor board)
4. Reassemble the radio.

Note: D45 will expand RX from 68 Mhz to 88 Mhz. No information is available if this mod will cause another band range to be removed.



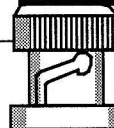
Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

Radio Shack - 17

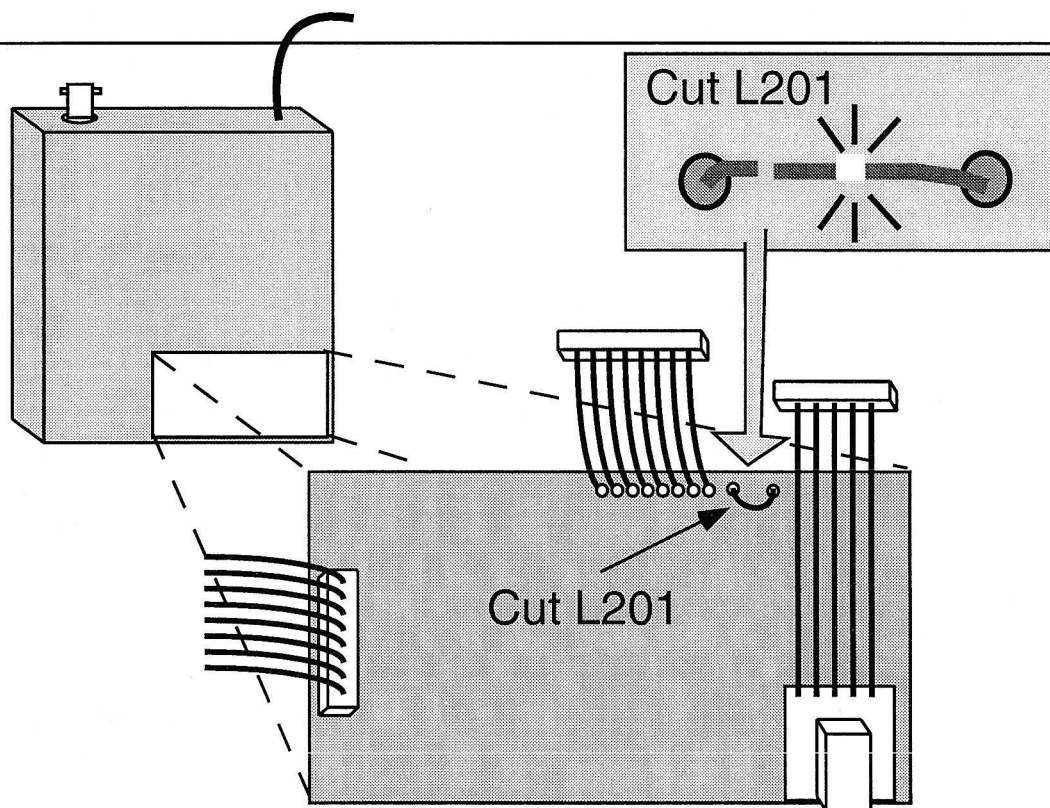
SCANNERS



Expansion Range

The Exact range of this scanner is not know as of press time. However most scanners will cover the the entire 800-900 MHz range after a modification.

This modification will not work on scanners that were produced after the FCC Scanner law of 1994. Reports show that units with serial numbers starting with the 4500 series have a new microprocessor. As of press time no new modification is available for these scanners. Use the Phone Support form in the back of this book to request any updates that may become available.

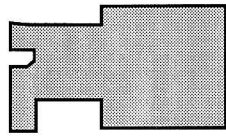


Expanded RF Modification

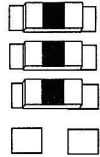
1. Remove Power and Antenna.
2. Remove 4 screws from the bottom case.
3. Remove covers.
4. Locate the small circuit board near the lower right-hand corner.
5. Locate and **cut Silver Wire jumper L201.**
6. Reassemble the radio.

Expansion Range

806 MHz - 960 MHz

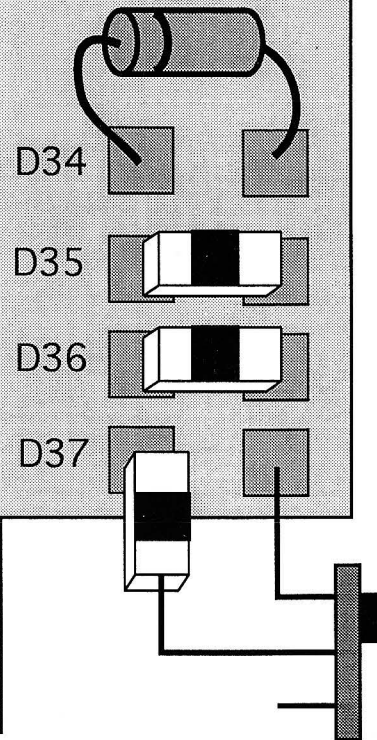


PRO-2027



with 1N914

1N914



with Chip Diode

Install to cover 806 - 960 MHz
(Continuous)

Removed for 800 MHz

Installed for 800/900 range
(Blocked)

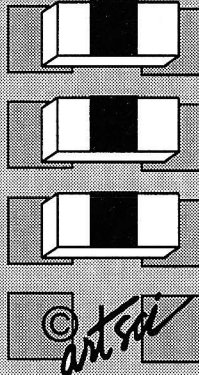
Install for 68-88 MHz
Remove for 30-54 MHz

D34

D35

D36

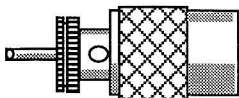
D37



One user suggests you connect the diode with a switch so you can switch between 30-54 MHz & 68-88 MHz

Expanded RF Modification

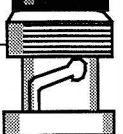
1. Remove Power and Antenna.
2. Remove 4 screws from the bottom and open case.
3. Locate the four diode on the lower left of the CPU board.
4. **Solder install a diode in position D34.** (same polarity as other diodes)
(a 1N914 may be used) (Some reports say that Diode D35 may be removed and used)
5. Reassemble the radio.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci



Expansion Range

806 MHz - 956 MHz

This modification will not work on scanners that were produced after the FCC Scanner law of 1994. Reports show that units with serial numbers starting with the 4500 series have a new microprocessor. As of press time no new modification is available for these scanners. Use the Phone Support form in the back of this book to request any updates that may become available.

The Difference between the old model and the new one:

The new model has a UC-1516A Chip

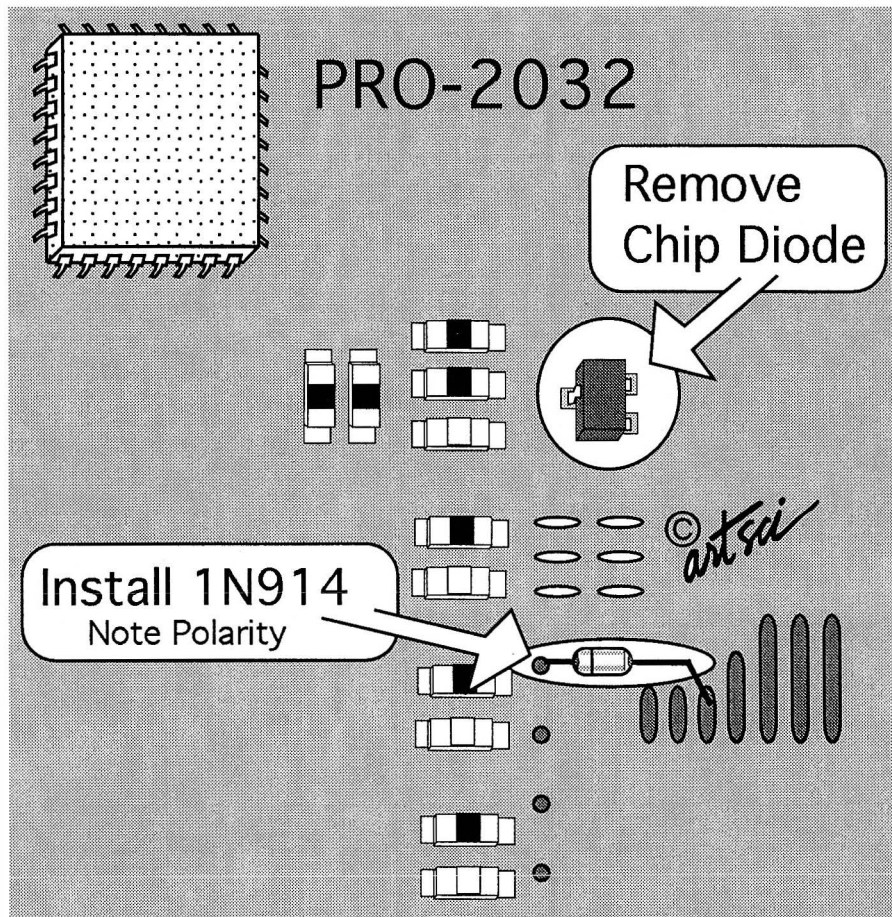
1. D-204 (HZ4A2) has been removed and shorted.
2. L201 (LE351) is removed and open.

Expanded RF Modification

1. Remove Power and Antenna.
2. Remove screws from the bottom and remove the bottom case.
3. Locate small circuit board in the lower right corner.
4. Locate and **Cut jumper L201**.
5. Reassemble the radio.

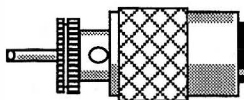
Expansion Range

806 MHz - 956 MHz



Expanded RF Modification

1. Remove Power and Antenna.
2. Remove top and bottom covers. (Watch out for the speaker wires)
3. Locate and remove microprocessor shield. (Near Volume and Squelch Controls)
4. Locate and **remove chip Diode** as shown in drawing.
5. **Install a 1N914 diode** as shown in drawing.
Make sure diode lead do not short or touch any other component.
6. Reassemble the scanner.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations
caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

Radio Shack - 21

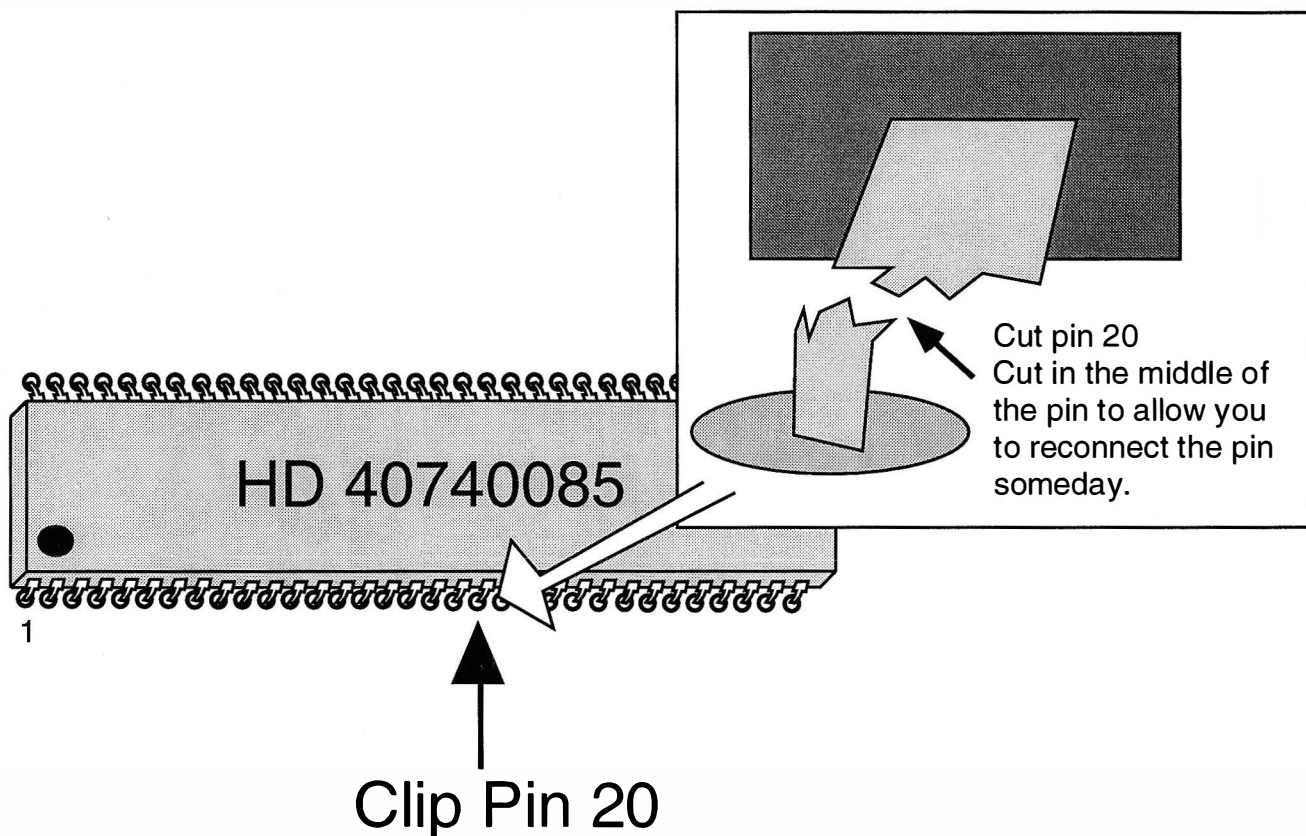


R-1600

No BNC Connector

Expansion Range

The Exact range of this scanner is not known as of press time. However most scanners will cover the the entire 800-900 MHz range after a modification.



Expanded RF Modification

1. Remove Power and Antenna.
2. Remove 4 screws from the bottom case and remove the bottom cover.
3. Locate the microprocessor and **clip pin 20**.
4. Reassemble scanner.

SCANNERS

Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

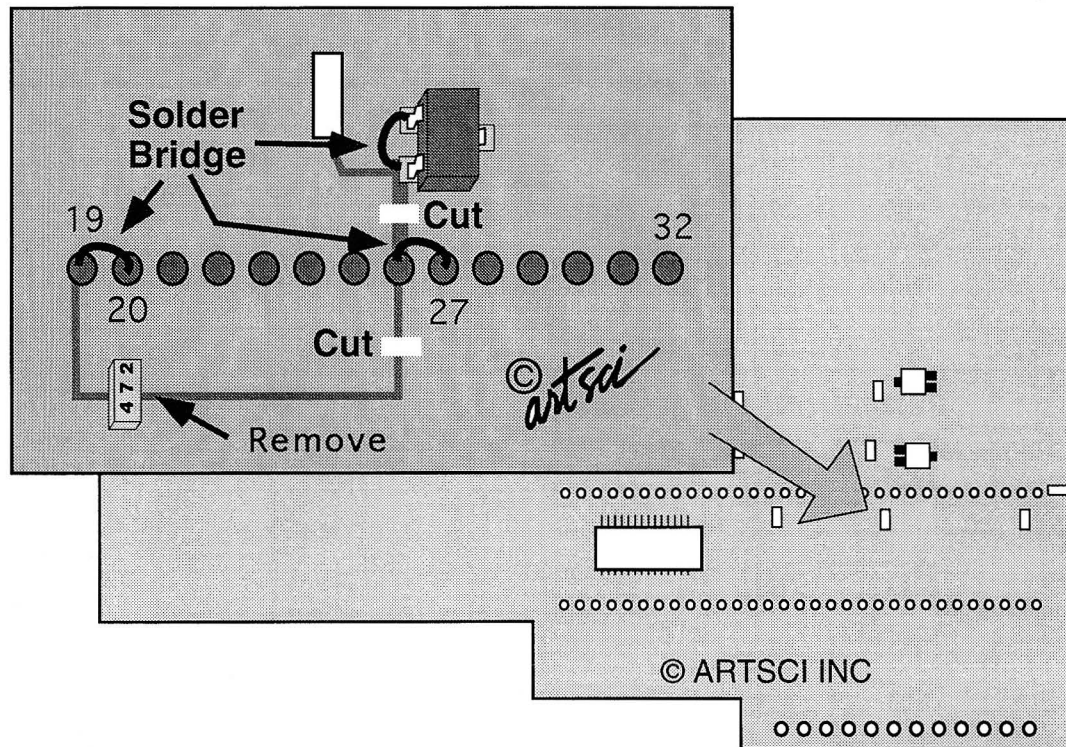
Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

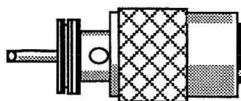
Expansion Range

The Exact range of this scanner is not know as of press time. However most scanners will cover the the entire 800-900 MHz range after a modification.



Expanded RF Modification

1. Remove Power and Antenna
2. Remove 4 screws from the bottom case remove the bottom cov.
3. Locate the SANYO IC. (Identification printed upside down with the front of the radi facing you.
4. Locate the long row of solder pins above the Sanyo I
5. Locate Pin 26 of the Microprocessor.
6. Cut the two traces leading to pin 26.
7. Solder bridge Pins 19 & 20 together
8. Solder bridge Pins 26 & 27 together
9. Solder bridge the two leads of the chip transistor above pin 27.
10. Unsolder or cut the 47K Chip Resistor marked "472"
11. Reassemble the radio.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci



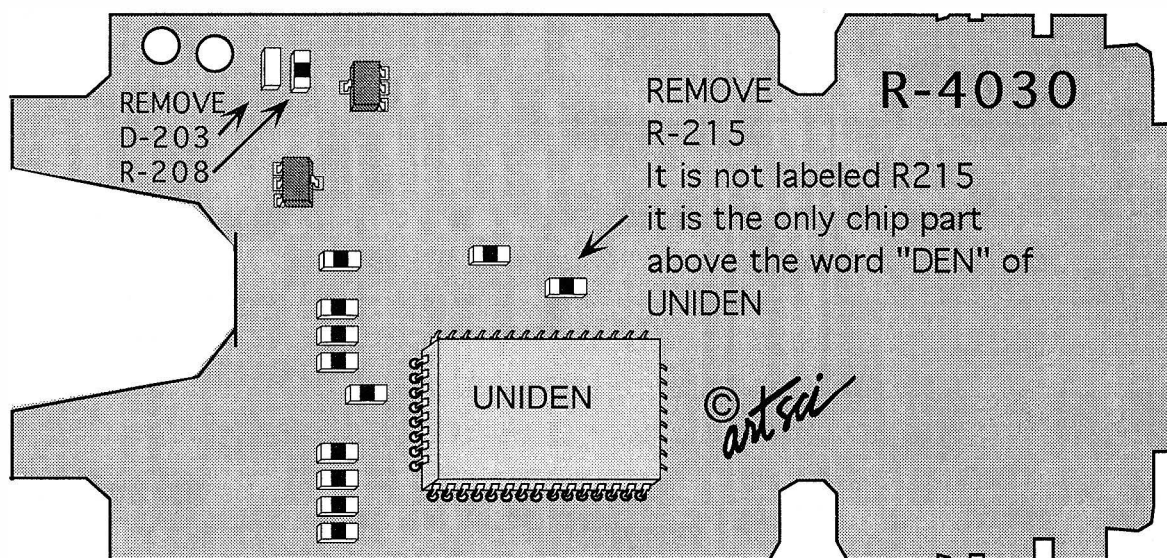
Radio/Tech Modifications

Frequency report

[illegible]

Expansion Range

The Exact range of this scanner is not know as of press time. However most scanners will cover the the entire 800-900 MHz range after a modification.



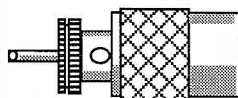
Expanded RF Modification

1. Remove Battery and Antenna
2. Remove 2 screws from case and 2 from the battery retaining plate and open case
3. Locate and remove two small screws at the base of the circuit board
4. Gently pull the front panel from the circuits.
5. Locate and remove the 10 K resistor R-215 located above the microprocessor (Uniden UC-1147). Note the resistor is above the "den" letters on the microprocessor.
6. Locate and remove the Diode D-203 and Resistor R-208 located by the Speaker. (Battery Mod)
6. Replace the front panel. Keep the holes in the bottom of the case and board lined up and make sure the dual in-line connector is reconnected properly.
7. Reassemble scanner.

If the radio fails to power up, recharge the battery or, the dual in-line connector was not inserted correctly. If the display will not work, make sure that the rows of fine pin are aligned properly with the socket.

Reset Command: Press & Hold [2], [9] & [MANUAL], Turn off and back on.

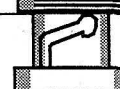
EARPHONE OUTPUT FIX (Bypass the limiting resistor) - Connect a wire from chassis ground to the earphone ground. Externally- Connect a wire from BNC Jack to Earphone jack.
INTERNALLY - Open the radio & solder a wire from chassis ground to the ground earphone lug.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
 Have the original book with you when you call with a question. **Use at your own Risk!**
 The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
 (818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci



Expansion Range

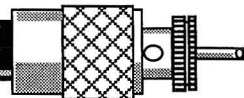
This mod will add 6 memory channels



This drawing is for visual demonstration only. The positioning is not accurate.

Expanded RF Modification

1. Remove Power and Antenna.
2. Remove 4 screws from case and open the two halves.
(careful the two halves are wired together.)
3. Locate the 30 pin IC with "UNIDEN" on the top.
4. Near the IC is a diode with insulating tubing on its leads
(one end of the diode is connected to the topside of the board and the other goes over the edge and is connected to the other side of the board.)
5. Clip one of the leads, (make sure the lead do not short anywhere)
6. Reassemble the radio

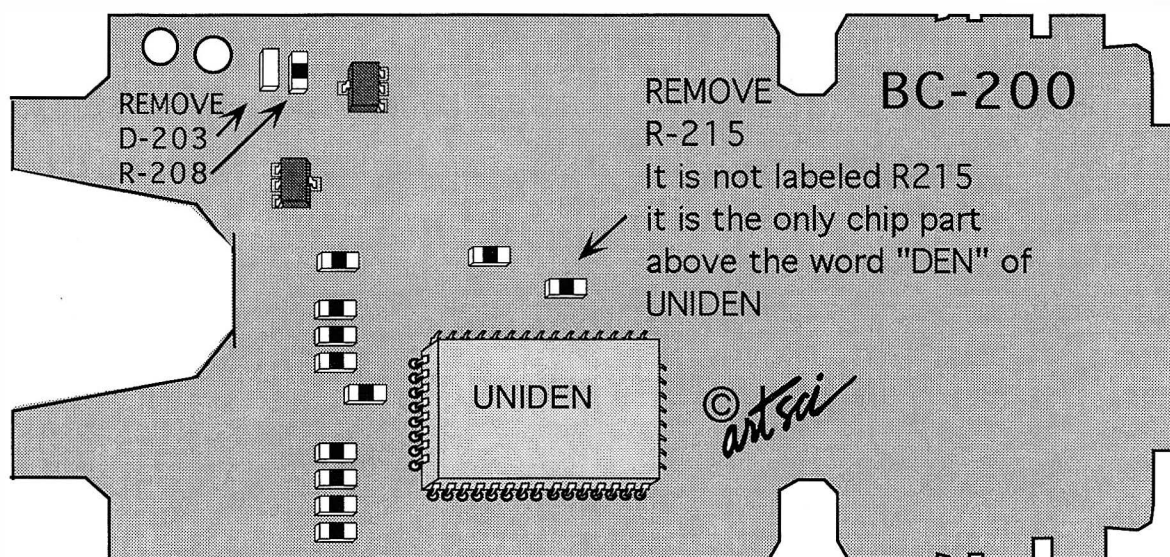


800 MHz Restoration Extended Battery Life Earphone audio fix

Uniden
BC-200XLT

Expansion Range

Entire 800 MHz band in 12.5 kHz steps
However most scanners will cover the the entire
800-900 MHz range after a modification.



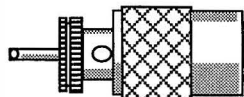
Expanded RF Modification

1. Remove Battery and Antenna
2. Remove 2 screws from case and 2 from the battery retaining plate and open case
3. Locate and remove two small screws at the base of the circuit board
4. Gently pull the front panel from the circuits.
5. Locate and remove the 10 K resistor R-215 located above the microprocessor (Uniden UC-1147). Note the resistor is above the "den" letters on the microprocessor.
6. Locate and remove the Diode D-203 and Resistor R-208 located by the Speaker. (Battery Mod)
6. Replace the front panel. Keep the holes in the bottom of the case and board lined up and make sure the dual in-line connector is reconnected properly.
7. Reassemble scanner.

If the radio fails to power up, recharge the battery or, the dual in-line connector was not inserted correctly. If the display will not work, make sure that the rows of fine pins are aligned properly with the socket.

Reset Command: Press & Hold [2], [9] & [MANUAL], Turn off and back on.

EARPHONE OUTPUT FIX (Bypass the limiting resistor) - Connect a wire from chassis ground to the earphone ground. Externally- Connect a wire from BNC Jack to Earphone jack.
INTERNALLY - Open the radio & solder a wire from chassis ground to the ground earphone lug.



Radio/Tech Modifications Volume A

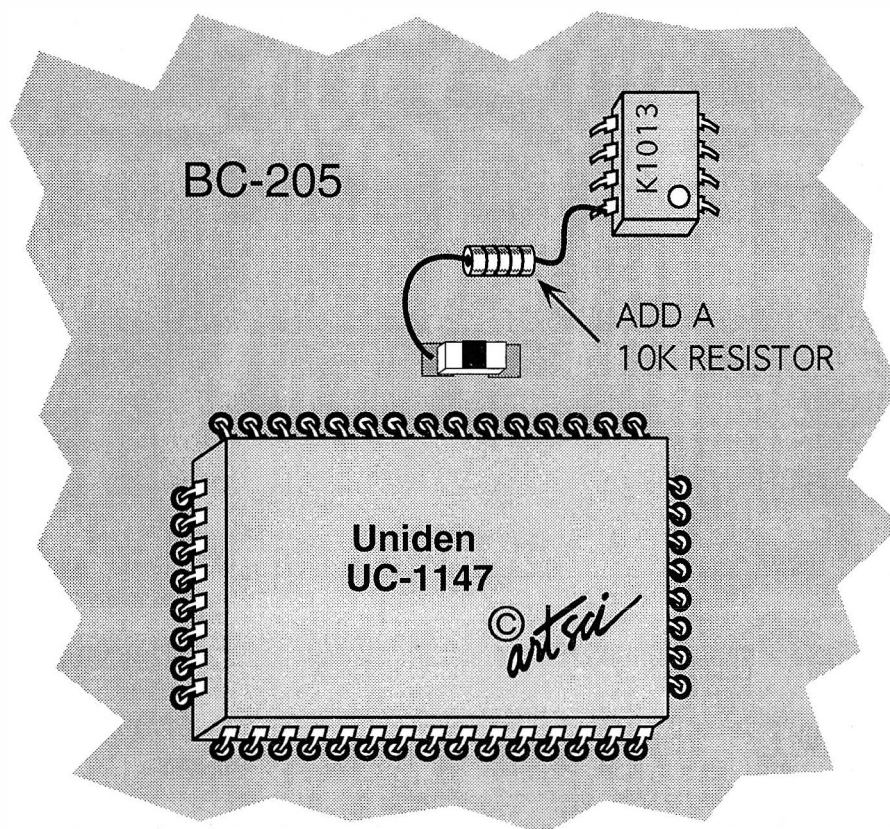
Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci



Expansion Range

The Exact range of this scanner is not known as of press time. However most scanners will cover the the entire 800-900 MHz range after a modification.



Expanded RF Modification

1. Remove Battery and Antenna.
2. Remove 2 screws from case and 2 from the battery retaining plate and open case.
3. Locate and remove two small screws at the base of the circuit board.
4. Gently pull the front panel from the circuits.
5. Locate the 10 K resistor located above the microprocessor (Uniden UC-1147). Note the resistor is above the "den" letters on the microprocessor.
6. **Add a 10K Resistor** to from the Chip resistor to Pin 8 of the adjacent K1013 IC.
7. Reassemble the radio.

If the radio fails to power up, recharge the battery or, the dual in-line connector was not inserted correctly. f the display will not work, make sure that the rows of fine pin are aligned properly with the socket.

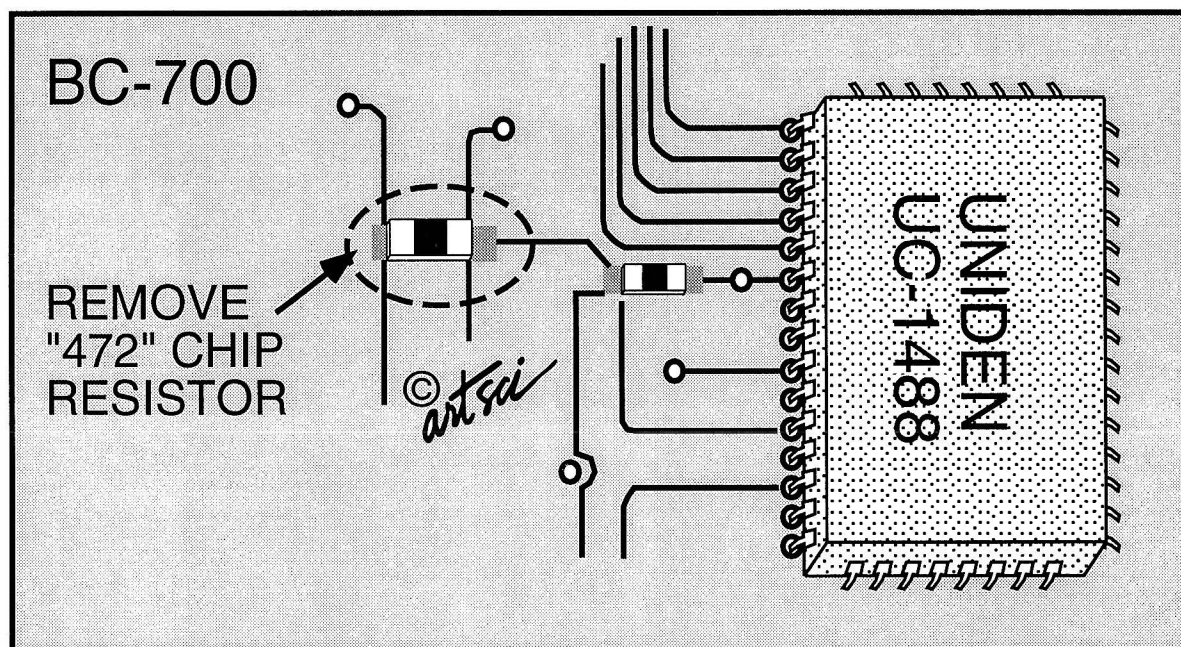
Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved. Have the original book with you when you call with a question. **Use at your own Risk!** The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules. (818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

Expansion Range

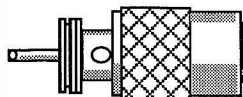
The Exact range of this scanner is not known as of press time. However most scanners will cover the the entire 800-900 MHz range after a modification.

This modification will not work on scanners that were produced after the FCC Scanner law of 1994. Reports show that units with serial numbers starting with the 4500 series have a new microprocessor. As of press time no new modification is available for these scanners. Use the Phone Support form in the back of this book to request ar updates that may become available



Expanded RF Modification

1. Remove Power and Antenna
2. Remove the screws from case and separate the two halve (Unplug the speaker)
3. Remove two face plate screws (on bottom of face plat
4. Unplug the cables to tilt the face plate fully forward.
5. Locate and remove the copper/plastic shield under the face plat
6. Locate and remove the chip resistor (labeled "472") as shown.
7. Reassemble the radio.



Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci



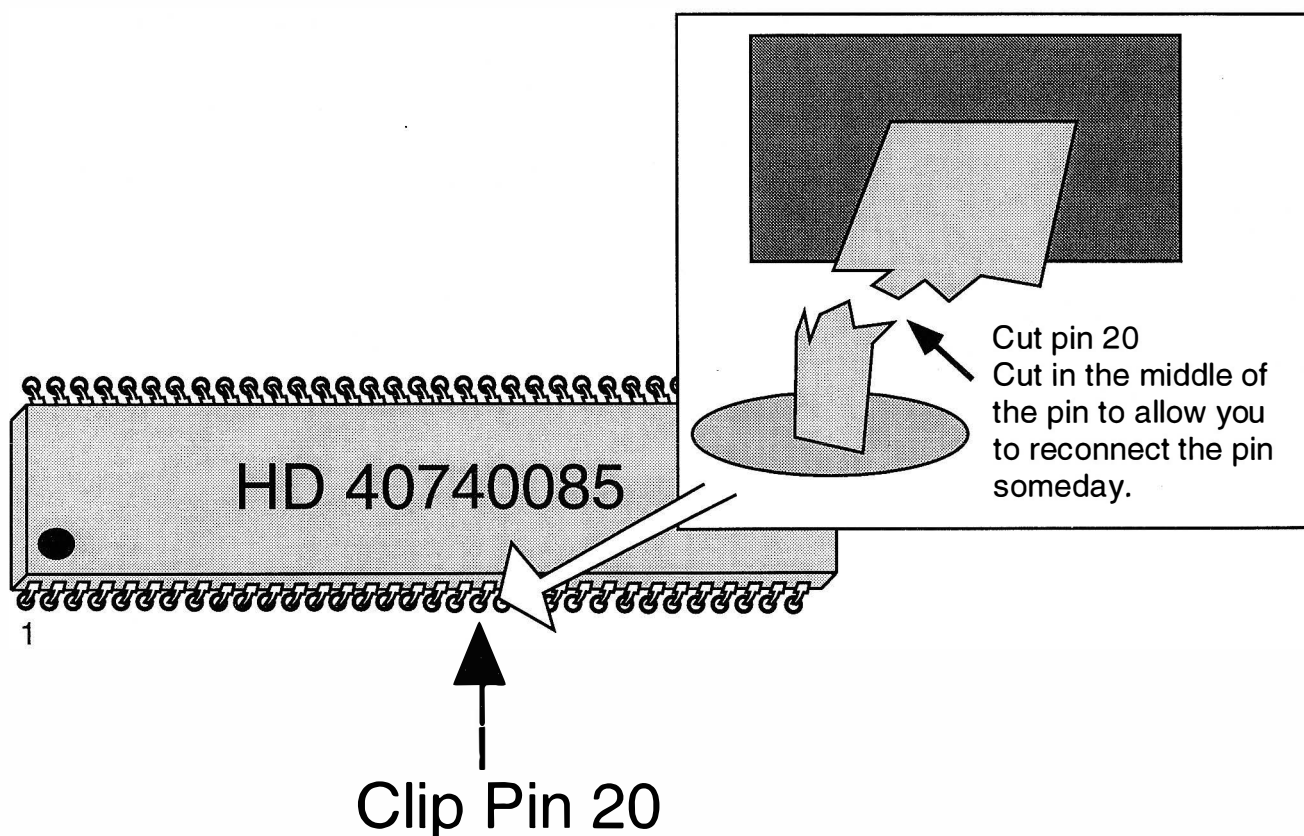
BC-760

no BNC
Connector

Expansion Range

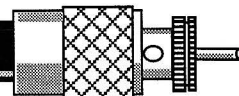
The Exact range of this scanner is not known as of press time. However most scanners will cover the the entire 800-900 MHz range after a modification.

This modification will not work on scanners that were produced after the FCC Scanner law of 1994. Reports show that units with serial numbers starting with the 4500 series have a new microprocessor. As of press time no new modification is available for these scanners. Use the Phone Support form in the back of this book to request ar updates that may become available



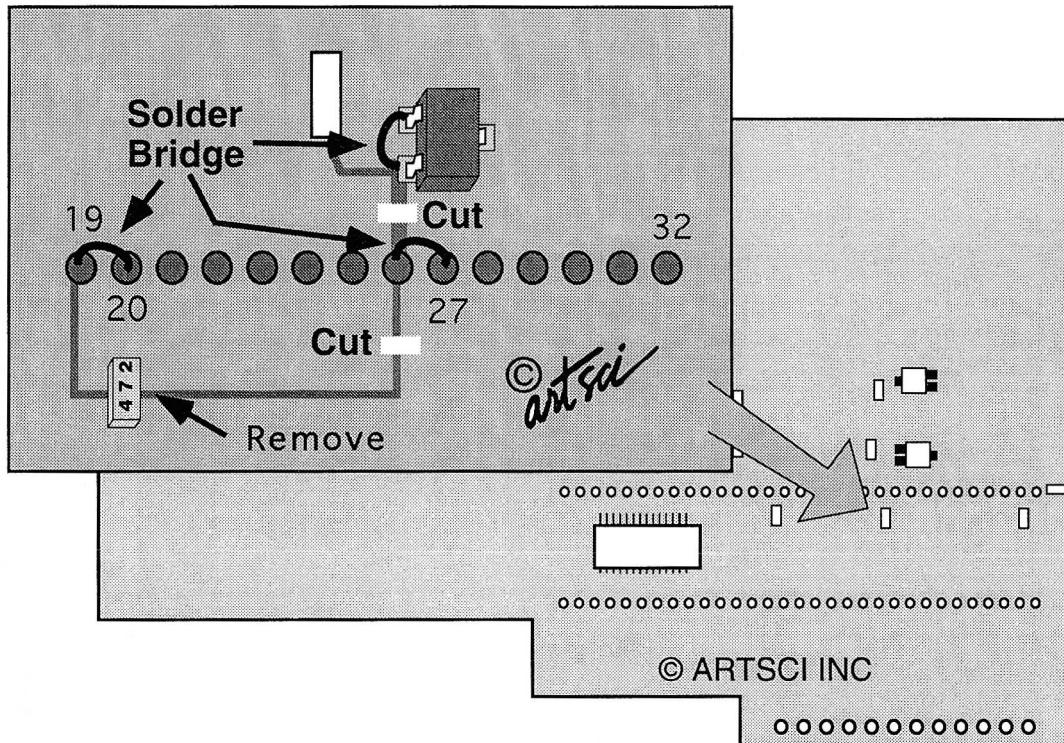
Expanded RF Modification

1. Remove Power and Antenna.
2. Remove 4 screws from the bottom case and remove the bottom cover.
3. Locate the microprocessor and **clip pin 20**.
4. Reassemble scanner.



Expansion Range

This modification will not work on scanners that were produced after the FCC Scanner law of 1994. Reports show that units with serial numbers starting with the 4500 series have a new microprocessor. As of press time no new modification is available for these scanners. Use the Phone Support form in the back of this book to request ar updates that may become available



Expanded RF Modification

1. Remove Power and Antenna
2. Remove 4 screws from the bottom case remove the bottom cov.
3. Locate the SANYO IC. (Identification printed upside down with the front of the radi facing you.
4. Locate the long row of solder pins above the Sanyo IC
5. Locate Pin 26 of the Microprocessor.
6. Cut the **two** traces leading to pin 26.
7. Solder bridge Pins 19 & 20 together
8. Solder bridge Pins 26 & 27 together
9. Solder bridge the two leads of the chip transistor above pin 27.
10. Unsolder or cut the 47K Chip Resistor marked "472"
11. Reassemble the radio.

Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

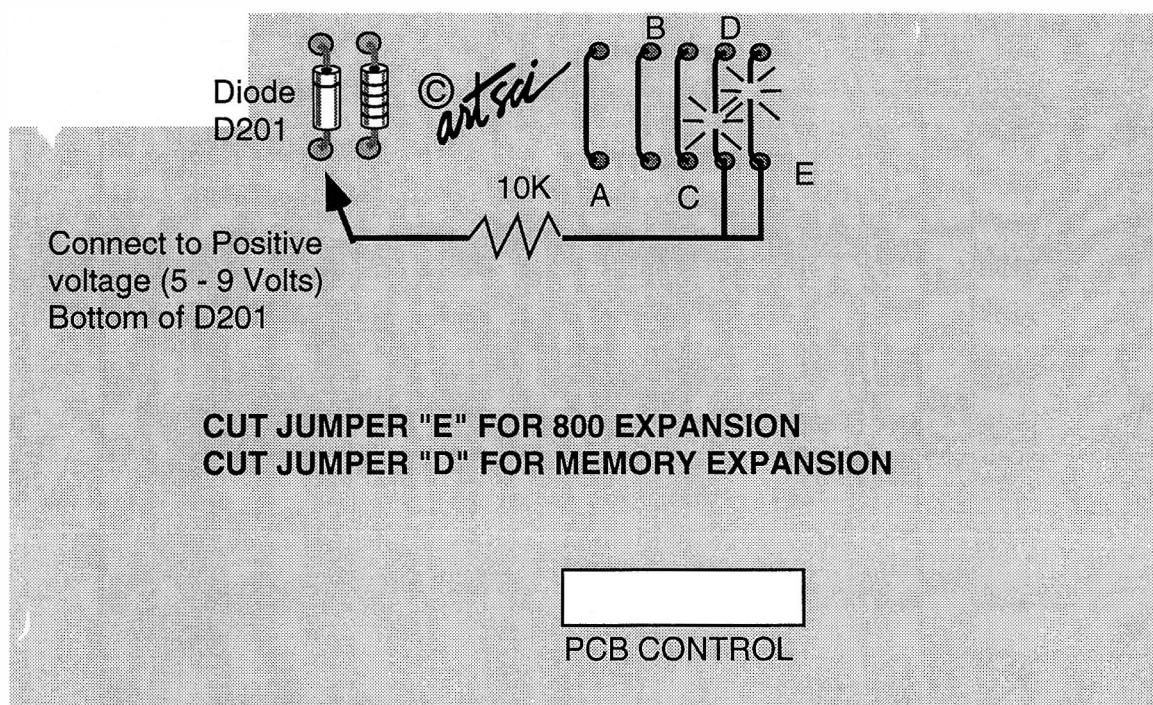
BC-855XLT

Model PH-120AD

Expansion Range

806 MHz - 956 MHz

Memory Expansion 5 banks of channels each



Expanded RF Modification

1. Remove Power and Antenna.
2. Remove screws and open radio.
3. Locate and **CUT jumper "E"** (FOR 800 EXPANSION).
3. Locate and **CUT jumper "D"** (FOR MEMORY EXPANSION).
4. **Solder a 10K resistor** from the cut position . (see drawing)
5. Locate a positive voltage source and attach other end of 10K resistor.
6. Assemble radio.

Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
 Have the original book with you when you call with a question. **Use at your own Risk!**
 The Author and all other parties take no responsibility for any damages or violations
 caused by these modifications. Some modifications may violate FCC rules.
 (818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

800 MHz Restoration

Uniden

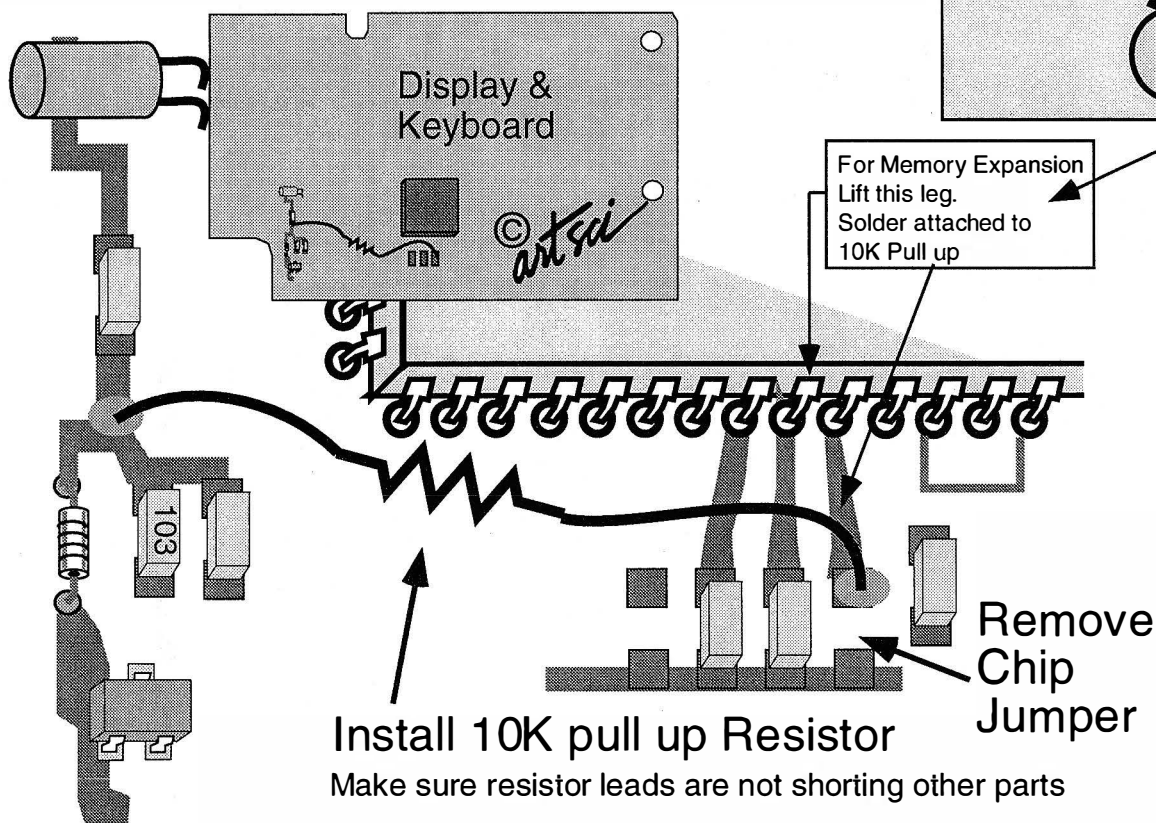
BC-855XLT
Model PH-120AF

Expansion Range

806 MHz - 956 Mhz

BC-855

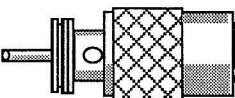
PH-120AF Models



Expanded RF Modification

1. Remove Power and Antenna.
2. Remove screws and open radio.
3. Remove screws securing the circuit board to the top panel.
4. Locate and remove chip jumper (see drawing)
5. **Solder a 10K pull up resistor** from old jumper point to 5 volts (see drawing)
6. For additional memory, **lift microprocessor leg and attach to 10 K Pull up.**
6. Reassemble the radio.

Radio/Tech Modifications Volume A



Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
Have the original book with you when you call with a question. **Use at your own Risk!**
The Author and all other parties take no responsibility for any damages or violations
caused by these modifications. Some modifications may violate FCC rules.
(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

© artsci

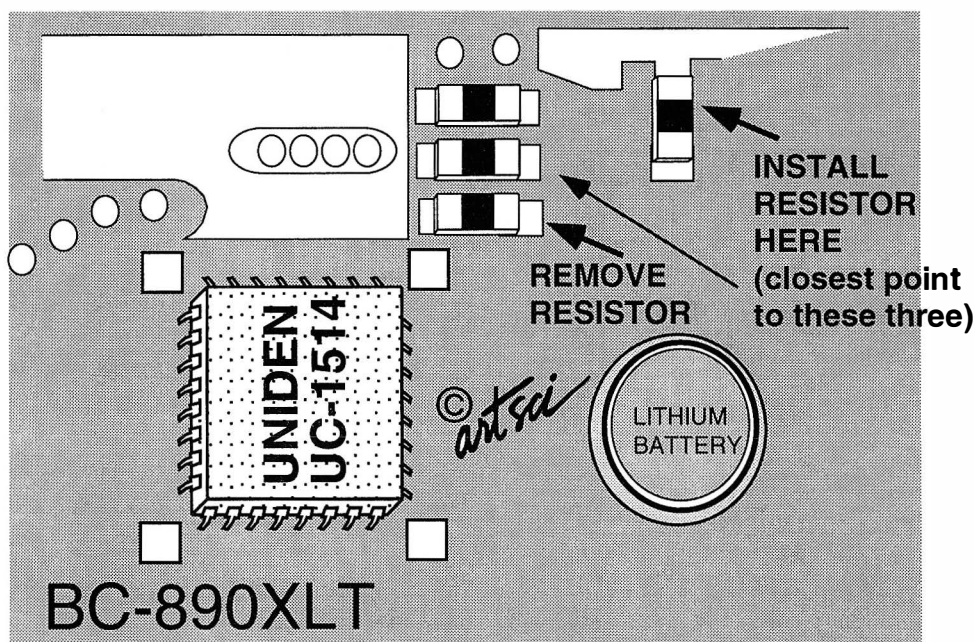
Uniden - 33



Expansion Range

The Exact range of this scanner is not known as of press time. However most scanners will cover the the entire 800-900 MHz range after a modification.

This modification will not work on scanners that were produced after the FCC Scanner law of 1994. Reports show that units with serial numbers starting with the 4500 series have a new microprocessor. As of press time no new modification is available for these scanners. Use the Phone Support form in the back of this book to request any updates that may become available.



Expanded RF Modification

1. Remove Power and Antenna.
2. Remove 10 case screws and open radio. (Unplug the speaker wires)
3. Remove the 4 screws on the front panel and the one bracket screw.
4. Tilt front panel forward.
5. Unplug connectors J4 (white) & J5(blue)
6. Unplug the ribbon connectors J501, J502 & J503.
7. Position Logic board (on face plate) and position board to match picture below.
8. Locate and **remove Chip Resistor** as shown (it is marked "104")
9. **Install the Chip resistor** as shown in drawing.
10. Reassemble the radio.
11. Reset the microprocesor (Press [MAN] & [2] & [9] & Turn power on.

Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.

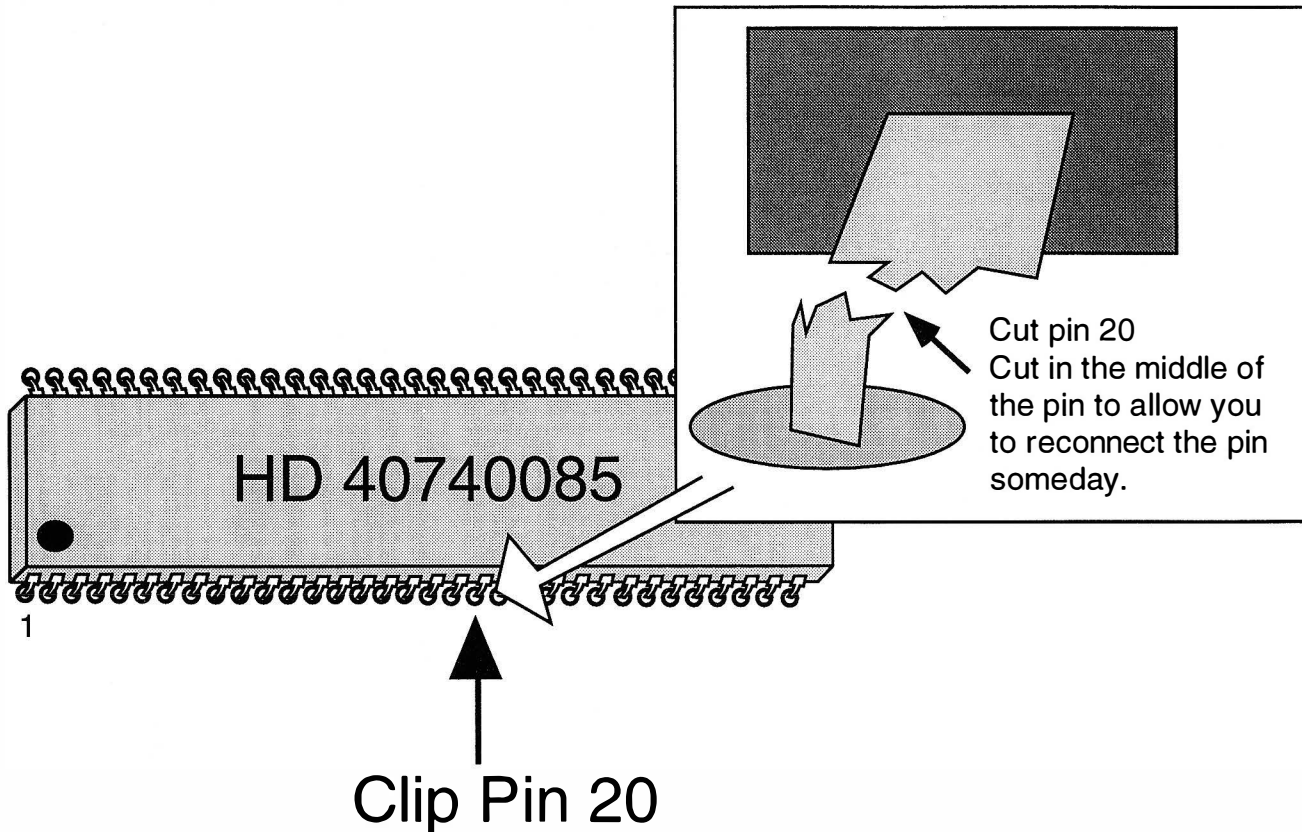
Have the original book with you when you call with a question. **Use at your own Risk!**

The Author and all other parties take no responsibility for any damages or violations caused by these modifications. Some modifications may violate FCC rules.

(818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

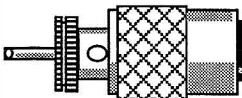
Expansion Range

The Exact range of this scanner is not known as of press time. However most scanners will cover the the entire 800-900 MHz range after a modification.



Expanded RF Modification

1. Remove Power and Antenna.
2. Remove 4 screws from the bottom case and remove the bottom cover.
3. Locate the microprocessor and **clip pin 20**.
4. Reassemble scanner.

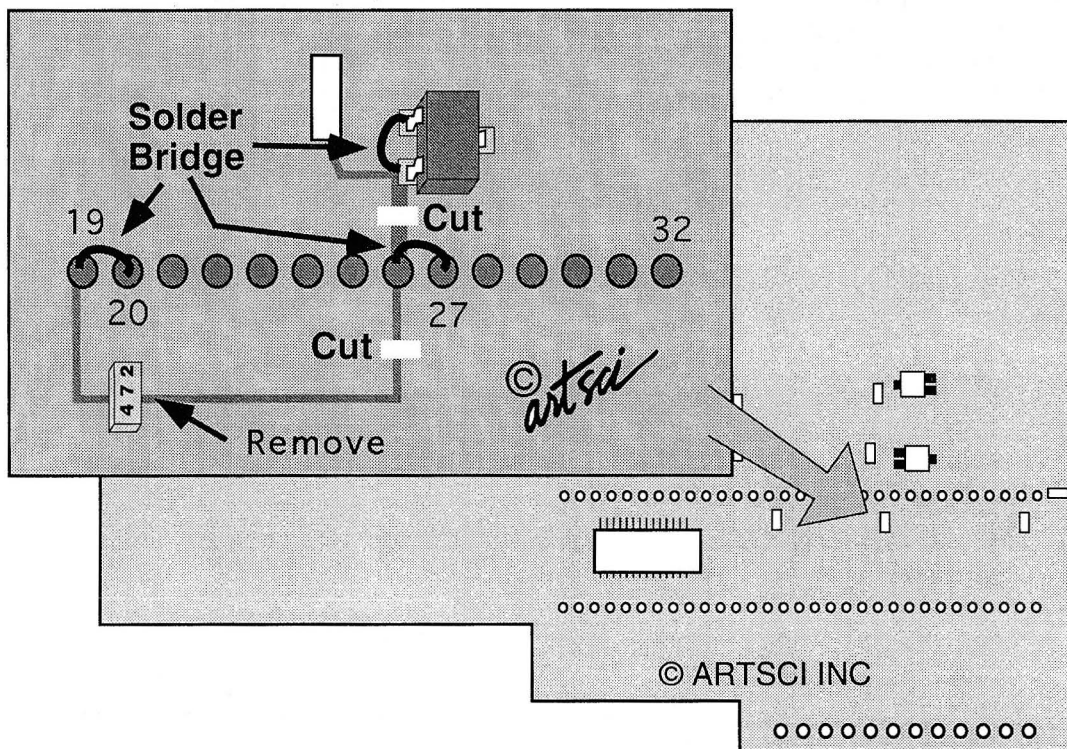


BC-950 XLT

With BNC Connector

Expansion Range

The Exact range of this scanner is not known as of press time. However most scanners will cover the the entire 800-900 MHz range after a modification.



Expanded RF Modification

1. Remove Power and Antenna
2. Remove 4 screws from the bottom case remove the bottom cov.
3. Locate the SANYO IC. (Identification printed upside down with the front of the radi facing you.
4. Locate the long row of solder pins above the Sanyo IC
5. Locate Pin 26 of the Microprocessor.
6. Cut the two traces leading to pin 26.
7. Solder bridge Pins 19 & 20 together
8. Solder bridge Pins 26 & 27 together
9. Solder bridge the two leads of the chip transistor above pin 27.
10. Unsolder or cut the 47K Chip Resistor marked "472"
11. Reassemble the radio.

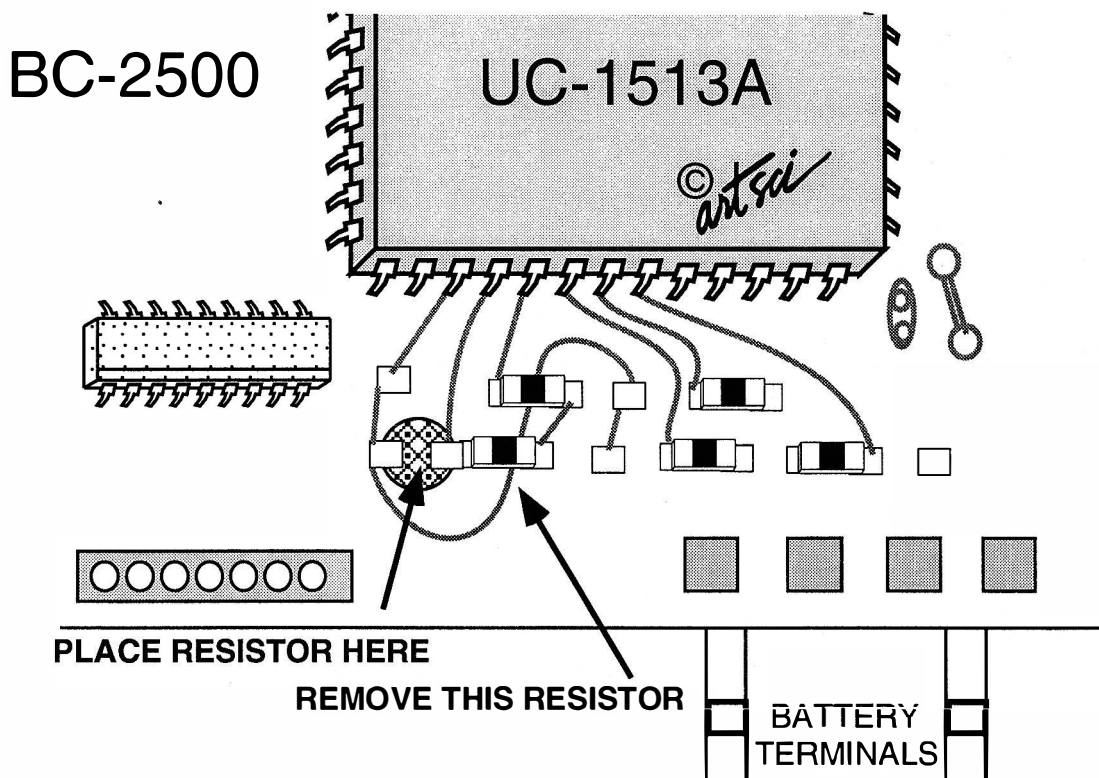
Radio/Tech Modifications Volume A

Photocopies are a violation of copyright law. © artsci inc. all rights reserved.
 Have the original book with you when you call with a question. **Use at your own Risk!**
 The Author and all other parties take no responsibility for any damages or violations
 caused by these modifications. Some modifications may violate FCC rules.
 (818) 843-4080 12-4 PST • www.artscipub.com • artsci@artscipub.com

Expansion Range

The Exact range of this scanner is not known as of press time. However most scanners will cover the the entire 800-900 MHz range after a modification.

This modification will not work on scanners that were produced after the FCC Scanner law of 1994. Reports show that units with serial numbers starting with the 4500 series have a new microprocessor. As of press time no new modification is available for these scanners. Use the Phone Support form in the back of this book to request any updates that may become available.



Expanded RF Modification

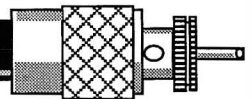
1. Remove Power and Antenna.
2. Remove the two black screws and the two silver screws from the back cover.
3. Open the radio
4. Locate the circuit board on the front half and unplug it from the front.
(note unplug the board from the 11 pin Molex connector)
5. Locate the microprocessor chip and the chip resistor below it.
6. Locate and **remove the indicated chip resistor and reinstall it as shown.**
7. Reassemble the radio.

Expansion Range

The Exact range of this scanner is not know as of press time. However most scanners will cover the the entire 800-900 MHz range after a modification.


Expanded RF Modification

1. Connect radio to the programming computer.
2. Place [CAP LOCK]=OFF & [# LOCK]=OFF.
3. Press [CONTROL] [ALT] [P].
4. Press [CAP LOCK]=ON.
5. Type ECPA1986 [ENTER].
6. Enter expanded frequencies.



QSL Card Order Form

KB6YZD

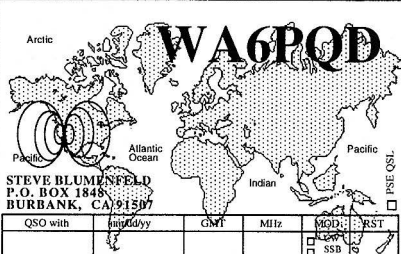


DOUG WYNN
P.O. BOX 1848
BURBANK, CA 91507

QSO with	mm/dd/yy	GMT	MHz	MODE	RST
				<input type="checkbox"/> CW <input type="checkbox"/> SSB	

Globe & Shuttle

WA6PQD




STEVE BLUMENFELD
P.O. BOX 1848
BURBANK, CA 91507

QSO with	mm/dd/yy	GMT	MHz	MODE	RST
				<input type="checkbox"/> CW <input type="checkbox"/> SSB	

World Map

N6MQS

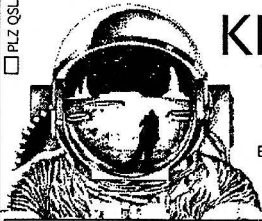


AMATEUR RADIO
Bill Smith • P.O. Box 1848 • Burbank, CA 91507

QSO with	DATE	TIME	FREQ	MODE	RST

License Plate

KB6YZD




DOUG WYNN
P.O. BOX 1428
BURBANK, CA 91507

QSO with	mm/dd/yy	UTC	MHz	MODE	RST

Astronaut

KB6SMS

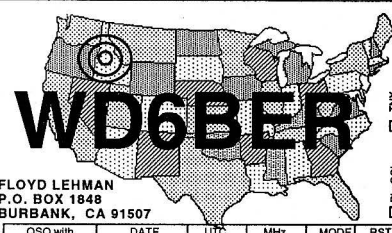


ARNOLD BRATTON
P.O. BOX 1848
BURBANK, CA 91507

QSO with	DATE	TIME	FREQ	MODE	RST

U.S. Map Ham Zones

WD6BER




FLOYD LEHMAN
P.O. BOX 1848
BURBANK, CA 91507

QSO with	DATE	UTC	MHz	MODE	RST

U.S. Map Patchwork

WR6S

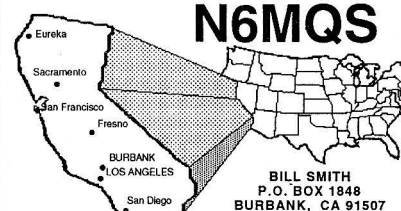


APOLLO 11 "EAGLE ON THE MOON"
PAT JASPER
P.O. BOX 1848
BURBANK, CA 91507

QSO with	DATE	TIME	FREQ	MODE	RST

Eagle on the moon

N6MQS




BILL SMITH
P.O. BOX 1848
BURBANK, CA 91507

QSO with	DATE	GMT	MHz	MODE	RST

California/U.S. (CAL ONLY)

KB6YZD



DOUG WYNN
P.O. BOX 1848
BURBANK, CA 91507

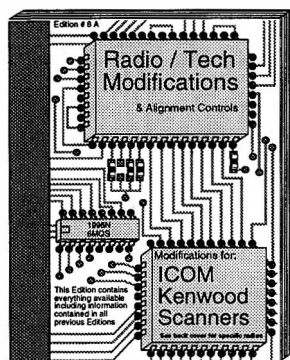
QSO with	mm/dd/yy	GMT	MHz	MODE	RST
				<input type="checkbox"/> CW <input type="checkbox"/> SSB	

Globe & Shuttle

QSL CARD ORDER FORM

<p>Call Sign _____ or "SWL"</p> <p>Name _____</p> <p>Address _____</p> <p>City, State Zip _____</p> <p>Phone # (____) _____-_____</p> <p><input type="checkbox"/> Put Phone # on QSL Card</p> <p><input type="checkbox"/> Put Phone # on Eyeball (small) Card</p>	<p>QSL ORDER FORM</p> <p>QSL Card Style (Choose one)</p> <p><input type="checkbox"/> U.S. Map Patchwork</p> <p><input type="checkbox"/> U.S. Map Ham Zones</p> <p><input type="checkbox"/> World Map dots</p> <p><input type="checkbox"/> World Map</p> <p><input type="checkbox"/> California/U.S.</p> <p><input type="checkbox"/> License Plate</p> <p><input type="checkbox"/> Astronaut</p> <p><input type="checkbox"/> Eagle on the moon</p> <p><input type="checkbox"/> Globe & Shuttle</p>
<p>• All QSL cards are printed on five colors of card stock. This gives you 20 cards in each color.</p> <p>• Delivery will be about 3-4 weeks.</p> <p>• SELECT desired QSL style.</p> <p>• Mail the form and Payment to the address below. 73s</p> <p>*** Order on the Internet *** http://www.artscipub.com/kamko.html</p>	<p><input type="checkbox"/> First 100 \$ 9.95</p> <p><input type="checkbox"/> Additional 100's \$ 6.95</p> <p><input type="checkbox"/> 100 Business card size \$ 8.95</p> <p><input type="checkbox"/> Package of QSL Holders \$ 6.99</p> <p>Mail this form and payment to:</p> <p>Kamko (818) 843-4080 P.O. Box 1428 Burbank, CA 91507</p> <p>Total _____</p> <p>TAX 8.25% _____</p> <p>Shipping \$ 4.00</p> <p>Total Due _____</p>

RADIO/TECH MODIFICATIONS



If you have even wondered how to enhance your Amateur radio, scanner or CB, then here's a book for you. Detailed picture drawings and step by step instructions will guide you through the modifications.

Modifications include extended transmit and receive frequency coverage, cross band (repeater)

operation and increased memory channels (different radios have different modification features). Alignment control drawings are presented with most modifications.

Some modifications are very simple to perform, others require experience with soldering and unsoldering. If additional parts are required, the part number and source is given.

This two volume set contains every modification known. There is no need to purchase older volumes, every new volume contains all the old modifications along with data on the new radios.

Volume _A contains over 200 pages packed full of information about **KENWOOD** and **ICOM** radios and **Uniden/Bearcat** , **Radio Shack** and **AOR** Scanners.

\$ 19.95

Volume _B contains over 200 pages packed full of information about **ALINCO** and **YAESU** radios and **STANDARD**, **AZDEN** and **10 METER & CB's** .

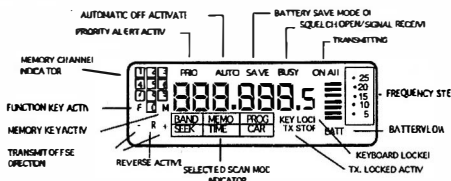
\$ 19.95

LOST USER MANUALS

Lost the manual for your HT or Mobile rig? Did you purchase a used radio and it did not come with a manual? Do you have the manual but still can't work the radio quickly?

"LOST USERS MANUALS" contains **operating instructions** for all the popular amateur radios and scanners. **ICOM**, **Yaesu**, **Kenwood**, **Alinco**, **Standard**, **Uniden** and other manufacturers' radios. Each radio is given 2 to 5 pages of drawings, charts and programming instructions. Over 200 Pages. **2nd Edition**

\$ 19.95



FEDERAL ASSIGNMENTS Vol 6



Ever wonder what the government was up to? Think the D.E.A. is in your neighborhood, possibly checking out your neighbors? Tune in with your scanner and find out!!

The Frequency assignment master file has complete listings of all U.S. government frequencies listed by agency and in frequency order. Includes Departments of: Agriculture, Air Force, Army, Commerce, Defense,

Energy, Health and Human Services, Housing and Urban Development, Interior, Justice, Labor, Navy, State, Treasury, Transportation and 29 Independent agencies & Commissions.

This sixth edition has over 5,000 new entries and over 300 pages. You'll be amazed at what is going on in your neighborhood!! Listen in and find out. Now in the handy 6" x 9" size

\$ 24.95

MetroSCAN

The search for what's happening in **Southern California** has been an ongoing affair since police and other government agencies started using radios for their communications. The improvement in scanner hardware and antennas has been fantastic. Unfortunately, the available frequency books have not kept pace with the times.



First there was "Police Call", then others have come and gone and have the same problem, inaccurate and outdated information.

Now comes the newest book from the Communications Research Counsel, "MetroSCAN". Not only is this book accurate and timely, but it is organized in a format

that is easy to use. Even the back cover presents a "CITY INDEX QUICK FINDER."

For those who want all the information available, the PL (private line) subaudible squelch tone codes are also listed!! Maps of radio sites and all LAPD reporting districts are included in the back of the book. 356 pages. 8.5" x 11".

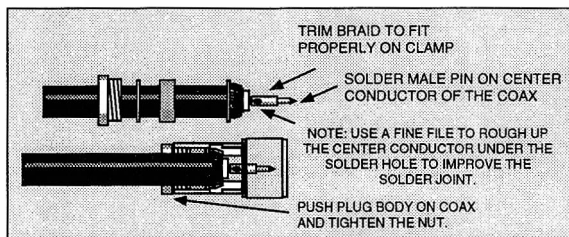
\$ 19.95

A complete listing of modifications contained in each volume is available on our Internet Web site.
www.artscipub.com

AMATEUR REFERENCE

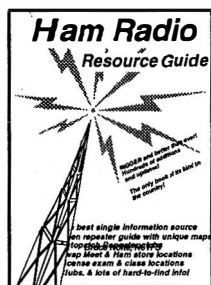
AMATEUR HANDBOOK

Why search through countless books for that one piece of information when its so easy to find in the Amateur Hambook. A true cornucopia of technical information for ham radio. Not only will you find the theoretical aspects, you will find real practical information presented in a no nonsense form.



Equipment & Log Sheets, Charts, Tables showing: worldwide callsigns, world times, shortwave listening frequencies, coax losses, CTCSS details, conversions, construction plans, emergency information, etc. This book contains all the useful information a amateur radio operator needs to reference. 133 pages. \$ 14.95

HAM RADIO RESOURCE GUIDE



For Southern California only. A booklet of all the information an amateur radio operator needs. Listings of clubs, testing centers, radio stores and surplus dealers. Maps of repeaters, store and swap meet locations. Listing of Packet repeaters, phone BBS and node lists. 64 pages 8 1/2" X 5 1/2", \$ 9.95

NORTH AMERICAN SHORTWAVE DIRECTORY

If you are interested in Shortwave, this **third edition** book will help bring the world closer. New in this edition are **world frequency maps** to help you tune into a specific country, anywhere in the world. The new quick country guide will help you tune in almost any time of the day or night.

Accurate and complete listings of **all English and Spanish broadcasts** on the 0 - 30 MHz shortwave bands that can be heard in North America. Listing are presented in frequency order. Over 200 pages.

\$19.95

Visit our on-line open repeater database on the internet.
www.artscipub.com

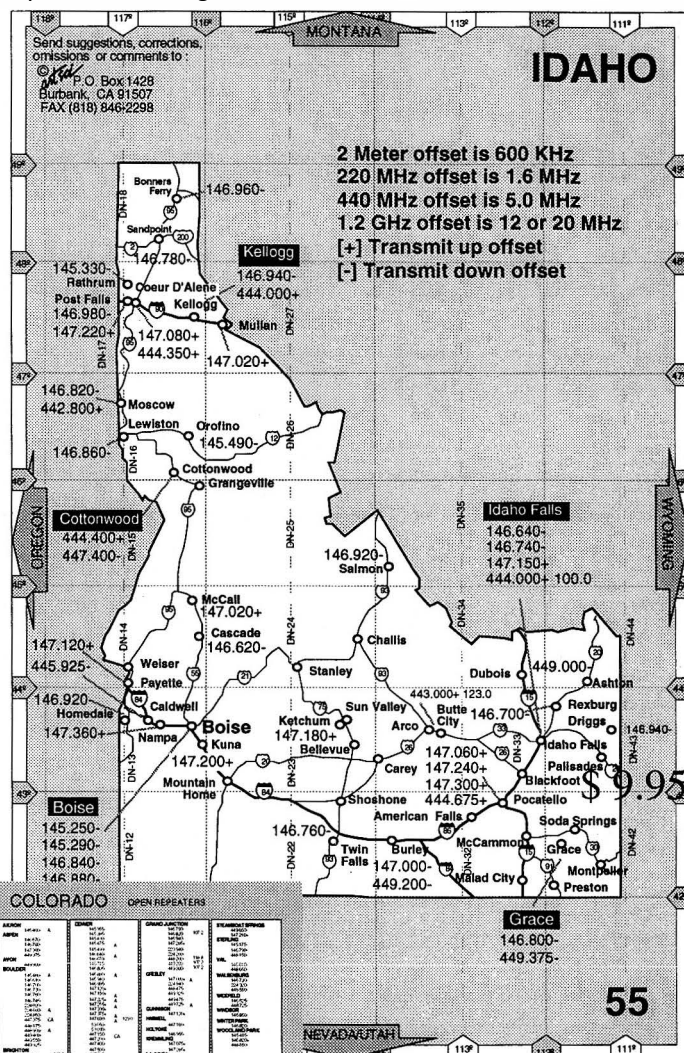
Web Page - www.artscipub.com
e-mail - artsci@artscipub.com

AMATEUR REFERENCE

U.S. REPEATER MAPBOOK

Now with Grid Squares on each state map!!

A PERFECT travelling companion. The Mapbook contains locations of hundreds upon hundreds of open repeaters throughout the U.S., Canada and Mexico.



These DETAILED maps show all highways and major cities in each state. If you travel anywhere in the United States, this MAPbook will be the best investment you ever made!!

The city by city table listings of every know open repeater in the state helps locate the nearest repeater. 10,6,2 meter, 220, 440 MHz and 1.2 GHz repeaters are shown.

artsci

artsci Publishing
P.O. Box 1428
Burbank, CA 91507
(818) 843-4080
FAX: (818) 846-2298

ORDER FORM

artsci

SHIP TO:

NAME		
ADDRESS		
CITY	ST	ZIP
PHONE ()		

BILLING INFORMATION

CARD #

Give us your phone number
in case we have a problem
processing your order.

EXP DATE

☐ CHECK ENCLOSED

☐ VISA / MasterCharge / DISCOVER / AMERICAN EXPRESS

Form 10B
MAIL ORDER
FORM TO:
Short-wave
Scanner
Reference
Amateur
Reference
Radio Reference

TITLE	DESCRIPTION	PRICE	QTY	EXTENSION
Radio/Tech Modifications Edition _ A	Over 200 pages of mods for ICOM, KENWOOD Radios & Radio Shack, Uniden and Regency Scanners	19.95		
Radio/Tech Modifications Edition _ B	Over 200 pages of mods for ALINCO, YAESU, STANDARD and all models of CB equipment.	19.95		
Lost Users Manuals	Operating Instructions for all popular amateur Mobiles & Ht's.	19.95		
U.S. Repeater Mapbook & repeater directory	VHF & UHF Repeater guide for North America with Maps showing popular repeaters and listings in city order.	9.95		
Amateur HamBook #2	Construction plans, coax, antenna, connector, SWR charts. A must have.	14.95		
Ham Radio Resource Guide	For Southern California only. Testing, Club, Repeater, maps & more	9.95		
Federal Assignments Volume #5	Scanner Frequency guide for all Federal Government Agencies. Over 300 pages	24.95		
Metro-Scan for Southern California	For Southern & Central California Scanner Listners. Best available freq. List !!	19.95		
North American Shortwave Directory	Complete Listing of all activity on the HF band 0-30 MHz. Maps and more.	19.95		

MAIL ORDER
FORM TO:

ARTSCI INC.
P.O. BOX 1428
BURBANK, CA 91507
(818) 843-4080
FAX: (818) 846-2298
<http://www.artscipub.com>

Shipping
charge outside
the U.S. is
\$10.00 or
more

SUBTOTAL

SALES TAX
8.25% CA

SHIPPING

ORDER
TOTAL

\$ 4.00

Mail this form inside an envelope to:

artsci

P.O. Box 1428
Burbank, CA 91507

Mail this form inside an envelope to:

artsci

P.O. Box 1428
Burbank, CA 91507

Mail this form inside an envelope to:

artsci

P.O. Box 1428
Burbank, CA 91507

— Proof of Purchase — Phone Support —

Return this form (NO PHOTOCOPIES) to artsci inc.

Phone Support will only be provided to verified owners of this book. When this form must be filled out and mailed to ARTSCI, your name and information will be added to our data base. When you call, we will verify that you are on file before any support is given. Verification may not be transferred to any other person.

NAME _____

Radio/Tech Modifications

ADDRESS _____

CITY _____ ST _____ ZIP _____

PHONE () - _____

10A

- ☐ I want the next version of this book when it becomes available.
Ship it to me and charge my card at that time.

CC# Number _____ Exp Date _____

— Cut on dotted line —

— Single mod or Book Purchase —

Return this form (NO PHOTOCOPIES) to artsci inc.

Return this form to order a new modification or the new edition. Verification may not be transferred to any other person. New radios not listed in the current edition may be purchased individually or when you place an advance order for a new edition, the mod you need can be sent in advance. Offer valid while edition 10 is in print.

NAME _____

Radio/Tech Modifications

ADDRESS _____

CITY _____ ST _____ ZIP _____

PHONE () - _____

10A

- ☐ I only want one Modification charge me \$5.00. Radio Manufacture & Model _____
☐ I want the new edition when available.
Send this mod NOW. Radio Manufacture & Model _____

CC# Number _____ Exp Date _____

— Cut on dotted line —

— Single mod or Book Purchase —

Return this form (NO PHOTOCOPIES) to artsci inc.

Return this form to order a new modification or the new edition. Verification may not be transferred to any other person. New radios not listed in the current edition may be purchased individually or when you place an advance order for a new edition, the mod you need can be sent in advance. Offer valid while edition 10 is in print.

NAME _____

Radio/Tech Modifications

ADDRESS _____

CITY _____ ST _____ ZIP _____

PHONE () - _____

10A

- ☐ I only want one Modification charge me \$5.00. Radio Manufacture & Model _____
☐ I want the new edition when available.
Send this mod NOW. Radio Manufacture & Model _____

CC# Number _____ Exp Date _____

Cut on dotted line

This edition contains modifications for:

ICOM

IC-02AT	∞	IC-900	∞•
IC-2A/AT	•	IC-901A	∞
IC-2iA	∞	IC-970	∞
IC-2GAT	∞•	IC-1200	∞
IC-2GXAT	∞	IC-2000	∞
IC-2SA	∞•	IC-2330	∞
IC-2SAT	∞•	IC-2340	∞
IC-2SRA	∞•	IC-2350	∞
IC-3SAT	∞•	IC-2400	∞•
IC-04AT	∞	IC-2410	∞
IC-4GAT	∞•	IC-2500	∞•
IC-4iA	∞	IC-2700	∞
IC-4SAT	∞•	IC-2710	∞
IC-4SRA	∞•	IC-3200	∞•
IC-12AT	∞	IC-3210	∞•
IC-12GAT	•	IC-3220	∞•
IC-24	∞•	IC-3230	∞
IC-25	∞•	IC-H16	∞
IC-27A/H	•	IC-M600	∞
IC-28A/H	∞	IC-M800	∞
IC-32AT	∞	IC-P2AT	∞•
IC-38	∞	IC-P4AT	∞•
IC-48	∞	IC-R1	∞
IC-207	∞	IC-R10	∞
IC-228	∞•	IC-R71	∞
IC-229	∞•	IC-R100	∞
IC-281	∞	IC-R7000	∞
IC-290	∞	IC-R7100	∞
IC-448	∞•	IC-R8500	∞
IC-449	∞•	IC-RP1220	∞
IC-481	∞	IC-RP1520	∞
IC-575	∞	IC-RP4020	∞
IC-706	∞	IC-RP4520	∞
IC-707	∞	IC-S21	∞
IC-720	∞	IC-S41	∞
IC-725	∞	IC-T7	∞
IC-726	∞	IC-T21	∞
IC-728	∞	IC-T22	∞
IC-729	∞	IC-T41	∞
IC-730	∞	IC-DELTA1	∞
IC-735	∞	IC-DELTA 100	∞
IC-736	∞	IC-U2AT	∞•
IC-737	∞	IC-U4AT	∞•
IC-738	∞	IC-U16	∞
IC-740	∞	IC-V21 AT	∞•
IC-745	∞	IC-W2A	∞•
IC-751	∞	IC-W21A	∞
IC-761	∞	IC-W21AT	∞
IC-765	∞	IC-W31	∞
IC-775	∞	IC-W32A	∞
IC-781	∞	IC-X2A	∞•
IC-820	∞	IC-X21AT	∞
IC-821	∞	IC-Z1A	∞
		IC HT'S TO TNC	

Kenwood

TH-21A	∞•	TM-701A	∞•
TH-22A	∞	TM-711	∞
TH-25A	∞•	TM-721	∞•
TH-26A	∞•	TM-731	∞•
TH-27A	∞•	TM-732	∞•
TH-28A	∞•	TM-733A	∞
TH-31A/BT	•	TM-741	∞
TH-41A/BT	•	TM-742	∞
TH-42AT	∞	TM-941	
TH-45A	∞•	TM-942	∞
TH-48A	∞•	TM-2530	∞•
TH-55A	•	TM-2550	∞•
TH-75A	∞	TM-2570	∞•
TH-77A	∞	TM-V7A	∞
TH-78A	∞•	TR-751	∞•
TH-79A	∞	TR-2500	∞
TH-205	∞	TR-2600	∞
TH-215	∞•	TS-50	∞
TH-225	∞•	TS-140S	∞
TH-315	∞•	TS-430S	∞
TM-221	∞•	TS-440S	∞
TM-231A	∞•	TS-450S	∞
TM-241A	∞•	TS-680	∞
TM-251A	∞	TS-690S	∞
TM-261	∞	TS-711	∞
TM-321	•	TS-790A	∞
TM-331	∞•	TS-850S	∞
TM-421	∞•	TS-870S	∞
TM-431A	∞•	TS-930S	∞
TM-441A	∞•	TS-940	∞
TM-621	∞•	TS-950SD	∞
TM-631	∞•	TS-2400	∞
TM-641	∞•	TW-4100	
TM-642	∞•	TM SERIES	

Scanners

Uniden Bearcat

BC-140	∞
BC-200	∞
BC-205	∞
BC-700	∞
BC-760	∞
BC-855	∞
BC-890	∞
BC-950	∞
BC-2500	∞
MR-8100	∞

Regency

R-4030	∞
R-1600	∞

Radio Shack

PRO-23	∞
PRO-33	∞
PRO-34	∞
PRO-37	∞
PRO-39	∞
PRO-43	∞
PRO-46	∞
PRO-50	∞
PRO-51	∞
PRO-2004	∞
PRO-2005	∞
PRO-2006	∞
PRO-2021	∞
PRO-2022	∞
PRO-2026	∞
PRO-2027	∞
PRO-2030	∞
PRO-2032	∞
PRO-2035	∞
PRO-2042	∞

AOR

AR-1500	∞
AR-8000	∞



artsai
10A

∞ Frequency Expansion
• Alignment controls

ISBN 0-917963-27-X

